

Module Catalogue

for the Subject

Mathematics

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

Examination regulations version: 2012
Responsible: Institute of Mathematics

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Content and Objectives of the Programme

The mathematics Bachelor programme is offered by the Department of Mathematics, with a total of (currently: SS 2010) nine chairs. At the end of this course of study, the student should be familiar with the main branches of Mathematics, taught methods of mathematical reasoning and working as well as analytical thinking, abstract concepts and the ability to recognise and construct complex structures and interconnections. Through the course these skills, which the students acquires provides the basic knowledge required for a consecutive Bachelor-Masters degree. Moreover, they can later familiarise themselves with the many areas of society, in which mathematical methods can be applied to or be of use. This is supported through the study of an integrated elective application-oriented subject (biology, chemistry, geography, computer science, philosophy, physics or economics), in which the choice of the student is trusted to utilise the basic thoughts and technical skills of the subject, where there is an application of mathematical methods. In the mathematics Bachelor study, the main emphasis is put on basic mathematical knowledge, method knowledge and the development of the mental constructs which are typical for mathematics. The acquisition of special topics in different secondary branches of mathematics is subordinate. For the Bachelor thesis the student should work on a thematic and temporally closely limited frame in order to carry out a mathematical task, using well-known procedures and scientific criteria under guidance but, to a large extent, independently. The exam enables the acquisition of a comparable, international degree in the field of mathematics and provides the framework of a consecutive Bachelor-Masters degree as an initial professional qualification, which can be used as a means for entry into the working world or as preparation for further Masters study. The exam should ascertain whether the candidate overlooks the context of the basics in mathematics and possesses the ability to use the related scientific methods, with regards to mathematics and the selected elective application-oriented subjects.

Abbreviations used

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

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

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

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

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

Conventions

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

Notes

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

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

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

In accordance with

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

ASPO2009

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

24-Oct-2012 (2012-167)

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

(109 ECTS credits)

Module title			Abbreviation
Analysis			10-M-ANA-122-m01
Module coordinator		Module offered by	
Dean of Studies Mathematik (Mathematics)		Institute of Mathematics	
ECTS	Method of grading	Only after succ. compl. of module(s)	
20	numerical grade	--	
Duration	Module level	Other prerequisites	
2 semester	undergraduate	By way of exception, additional prerequisites are listed in the section on assessments.	
Contents			
Real numbers and completeness, basic topological notions, convergence and divergence of sequences and series, differential and integral calculus in one variable, introduction to differential calculus in several variables.			
Intended learning outcomes			
The student knows and masters the essential methods and notions of analysis. He/She is able to perform easy mathematical arguments and present them adequately in written and oral form. He/She is acquainted with the central proof methods and concepts in analysis, their analytic background and geometric interpretation.			
Courses (type, number of weekly contact hours, language — if other than German)			
This module comprises 3 module components. Information on courses will be listed separately for each module component. <ul style="list-style-type: none">10-M-ANA-1-122: V + Ü (no information on SWS (weekly contact hours) and course language available)10-M-ANA-2-122: V + Ü (no information on SWS (weekly contact hours) and course language available)10-M-ANA-P-122: M (no information on SWS (weekly contact hours) and course language available)			
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)			
Assessment in this module comprises the assessments in the individual module components as specified below. Unless stated otherwise, successful completion of the module will require successful completion of all individual assessments.			
Assessment in module component 10-M-ANA-1-122: Analysis 1 Analysis 1 <ul style="list-style-type: none">8 ECTS, Method of grading: (not) successfully completedwritten examination (approx. 90 to 180 minutes); if announced by the lecturer, the written examination can be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups (groups of 2, approx. 30 minutes). Module will also be considered successfully completed if the module component was selected as subject of the oral examination covering several modules (separate module component for assessment purposes (Prüfungsteilmodul)) and this examination was passed.Language of assessment: German, English if agreed upon with the examinerOther prerequisites: Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew.			
Assessment in module component 10-M-ANA-2-122: Analysis 2 Analysis 2 <ul style="list-style-type: none">8 ECTS, Method of grading: (not) successfully completedwritten examination (approx. 90 to 180 minutes); if announced by the lecturer, the written examination can be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups (groups of 2, approx. 30 minutes). Module will also be considered successfully completed if the module component was selected as subject of the oral examination covering several modules (separate module component for assessment purposes (Prüfungsteilmodul)) and this examination was passed.Language of assessment: German, English if agreed upon with the examiner			
Bachelor's with 1 major Mathematics (2012)		JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Mathematik - 2012	
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- Other prerequisites: Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew.

Assessment in module component 10-M-ANA-P-122: Examination in Analysis

- 4 ECTS, Method of grading: numerical grade
- oral examination of one candidate each (approx. 30 minutes); assessment will have reference to the contents of modules 10-M-ANA-1 and 10-M-ANA-2
- Language of assessment: German, English if agreed upon with the examiner
- Only after successful completion of module components: Successful completion of the written examination in any one of the other two module components is a prerequisite for participation in module component 10-M-ANA-P.

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

§ 73 (1) 1. Mathematik Analysis

Module appears in

Bachelor' degree (1 major) Mathematics (2012)
Bachelor' degree (1 major) Mathematics (2013)
Bachelor' degree (1 major) Mathematical Physics (2012)
Bachelor' degree (1 major) Computational Mathematics (2012)
Bachelor' degree (1 major) Computational Mathematics (2013)

Module title			Abbreviation
Applied Mathematics			10-M-ANW-122-m01
Module coordinator		Module offered by	
Dean of Studies Mathematik (Mathematics)		Institute of Mathematics	
ECTS	Method of grading	Only after succ. compl. of module(s)	
20	numerical grade	--	
Duration	Module level	Other prerequisites	
2 semester	undergraduate	By way of exception, additional prerequisites are listed in the section on assessments.	
Contents			
<p>Two of the following topics in applied mathematics:</p> <p>Numerical Mathematics 1 (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)</p> <p>Numerical Mathematics 2 (Solution methods and applications for eigenvalue problems, linear programming, initial value problems for ordinary differential equations, boundary value problems)</p> <p>Stochastics 1 (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)</p> <p>Stochastics 2 (Elements of data analysis, statistics of data in normal and other distributions, elements of multivariate statistics)</p>			
Intended learning outcomes			
The student is acquainted with the fundamental concepts and notions of some field in applied mathematics. He/she is able to interconnect these concepts and and realises the advantages of thinking across the borders of different branches in mathematics.			
Courses (type, number of weekly contact hours, language — if other than German)			
<p>This module has 5 components; information on courses listed separately for each component.</p> <ul style="list-style-type: none">10-M-NUM-1-122, 10-M-NUM-2-122, 10-M-STO-1-122, and 10-M-STO-2-122: V + Ü (no information on language and number of weekly contact hours available)10-M-ANW-P-112: M (no information on language and number of weekly contact hours available)			
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)			
<p>This module has the following 5 assessment components. To pass this module, students must pass one out of the 4 assessment components that are first in the list below and the assessment component that is last in the list below.</p> <p>Assessment in module component 10-M-NUM-1-122: Numerische Mathematik 1 (Numerical Mathematics 1), in module component 10-M-NUM-2-122: Numerische Mathematik 2 (Numerical Mathematics 2), in module component 10-M-STO-1-122: Stochastik 1 (Stochastics 1), and in module component 10-M-STO-2-122: Stochastik 2 (Stochastics 2) :</p> <ul style="list-style-type: none">8 ECTS credits, pass / failwritten examination (approx. 90 to 180 minutes). If announced by the lecturer, 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. 30 minutes). The module component will also be considered successfully completed if it is selected as subject of the oral examination covering several modules (separate module component for assessment purposes (Prüfungsteilmodul)) and this examination is passed.Language of assessment: German; English if agreed upon with examiner(s)Additional prerequisites: To qualify for admission to assessment, students must meet certain prerequisites. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If stu-			
Bachelor's with 1 major Mathematics (2012)		JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Mathematik - 2012	
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dents have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew.

Assessment in module component 10-M-ANW-P-112: Prüfung Angewandte Mathematik (Assessment Applied Mathematics)

- 4 ECTS credits, numerical grading
- oral examination of one candidate each (approx. 30 minutes). Assessment will have reference to the topics covered in the two module components selected by students.
- Language of assessment: German; English if agreed upon with examiner(s)
- Only after successful completion of module components: Module component 10-M-ANW-P can only be taken by students who passed the written examination in one of the other four module components.

Allocation of places

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Additional information

Additional information on module duration: 1 to 2 semesters.

Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Mathematics (2012)

Bachelor' degree (1 major) Mathematics (2013)

Module title			Abbreviation
Linear Algebra			10-M-LNA-122-m01
Module coordinator		Module offered by	
Dean of Studies Mathematik (Mathematics)		Institute of Mathematics	
ECTS	Method of grading	Only after succ. compl. of module(s)	
20	numerical grade	--	
Duration	Module level	Other prerequisites	
2 semester	undergraduate	By way of exception, additional prerequisites are listed in the section on assessments.	
Contents			
Basic notions and structures; vector spaces, linear maps and systems of linear equations; theory of matrices and determinants; eigenvalue theory; bilinear forms and Euclidean/unitary vector spaces; diagonalisability and Jordan normal form.			
Intended learning outcomes			
The student knows and masters the basic notions and essential methods of linear algebra. He/She is able to perform easy mathematical arguments independently, and can present them adequately in written and oral form. He/She is able to apply the central proof methods and concepts of linear algebra and knows about their algebraic and geometric background.			
Courses (type, number of weekly contact hours, language — if other than German)			
This module comprises 3 module components. Information on courses will be listed separately for each module component. <ul style="list-style-type: none">10-M-LNA-1-122: V + Ü (no information on SWS (weekly contact hours) and course language available)10-M-LNA-2-122: V + Ü (no information on SWS (weekly contact hours) and course language available)10-M-LNA-P-122: M (no information on SWS (weekly contact hours) and course language available)			
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)			
Assessment in this module comprises the assessments in the individual module components as specified below. Unless stated otherwise, successful completion of the module will require successful completion of all individual assessments.			
Assessment in module component 10-M-LNA-1-122: Linear Algebra 1 Linear Algebra 1 <ul style="list-style-type: none">8 ECTS, Method of grading: (not) successfully completedwritten examination (approx. 90 to 180 minutes); if announced by the lecturer, the written examination can be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups (groups of 2, approx. 30 minutes). Module will also be considered successfully completed if the module component was selected as subject of the oral examination covering several modules (separate module component for assessment purposes (Prüfungsteilmodul)) and this examination was passed.Language of assessment: German, English if agreed upon with the examinerOther prerequisites: Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew.			
Assessment in module component 10-M-LNA-2-122: Linear Algebra 2 Linear Algebra 2 <ul style="list-style-type: none">8 ECTS, Method of grading: (not) successfully completedwritten examination (approx. 90 to 180 minutes); if announced by the lecturer, the written examination can be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups (groups of 2, approx. 30 minutes). Module will also be considered successfully completed if the			

module component was selected as subject of the oral examination covering several modules (separate module component for assessment purposes (Prüfungsteilmodul)) and this examination was passed.

- Language of assessment: German, English if agreed upon with the examiner
- Other prerequisites: Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew.

Assessment in module component 10-M-LNA-P-122: Examination in Linear Algebra

- 4 ECTS, Method of grading: numerical grade
- oral examination of one candidate each (approx. 30 minutes); assessment will have reference to the contents of modules 10-M-LNA-1 and 10-M-LNA-2
- Language of assessment: German, English if agreed upon with the examiner
- Only after successful completion of module components: Successful completion of the written examination in any one of the other two module components is a prerequisite for participation in module component 10-M-LNA-P.

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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

Module appears in

Bachelor' degree (1 major) Mathematics (2012)
 Bachelor' degree (1 major) Mathematics (2013)
 Bachelor' degree (1 major) Mathematical Physics (2012)
 Bachelor' degree (1 major) Computational Mathematics (2012)
 Bachelor' degree (1 major) Computational Mathematics (2013)

Module title			Abbreviation
Pure Mathematics			10-M-REI-122-m01
Module coordinator		Module offered by	
Dean of Studies Mathematik (Mathematics)		Institute of Mathematics	
ECTS	Method of grading	Only after succ. compl. of module(s)	
20	numerical grade	--	
Duration	Module level	Other prerequisites	
2 semester	undergraduate	By way of exception, additional prerequisites are listed in the section on assessments.	
Contents			
<p>Two of the following topics in pure mathematics:</p> <p>Introduction to Algebra (Fundamental algebraic structures: groups, rings, fields; Galois theory)</p> <p>Introduction to Differential Geometry (Curves in Euclidean spaces, curvature, Frenet equations, local classification, submanifolds in Euclidean spaces, hypersurfaces in particular, curvature of hypersurfaces, geodesics, isometries, main theorem on local surface theory, special classes of surfaces)</p> <p>Ordinary Differential Equations (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)</p> <p>Introduction to Complex Analysis (Complex differentiability and Cauchy-Riemann differential equations, path integrals and Cauchy integral theorems, isolated singularities, meromorphic functions and Laurent series, residue theorem and applications, Weierstraß product theorem and theorem of Mittag-Leffler, conformal maps)</p> <p>Geometric Analysis (Fundamentals in analysis on manifolds, submanifolds, calculus of differential forms, Stoke's theorem and applications in vector analysis and topology)</p> <p>Introduction to Projective Geometry (Projective and affine planes, projective and affine spaces, theorem of Desargues, fundamental theorems for projective spaces, dualities and polarities of projective spaces).</p>			
Intended learning outcomes			
The student is acquainted with fundamental concepts and methods in pure mathematics. He/She is able to relate these concepts with one another, and realises the advantages of thinking across the borders of different branches in mathematics.			
Courses (type, number of weekly contact hours, language — if other than German)			
<p>This module has 7 components; information on courses listed separately for each component.</p> <ul style="list-style-type: none">10-M-ALG-1-122, 10-M-DGE-1-122, 10-M-DGL-1-122, 10-M-FTH-1-122, 10-M-GAN-1-122, and 10-M-PGE-1-122: V + Ü (no information on language and number of weekly contact hours available)10-M-REI-P-122: M (no information on language and number of weekly contact hours available)			
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)			
<p>This module has the following 7 assessment components. To pass this module, students must select two out of the 6 assessment components that are first in the list below and pass one of them, furthermore they must pass the assessment component that is last in the list below.</p> <p>Assessment in module component 10-M-ALG-1-122: Einführung in die Algebra (Introduction to Algebra), in module component 10-M-DGE-1-122: Einführung in die Differentialgeometrie (Introduction to Differential Geometry), in module component 10-M-DGL-1-122: Gewöhnliche Differentialgleichungen (Ordinary Differential Equations), in module component 10-M-FTH-1-122: Einführung in die Funktionentheorie (Introduction to Complex Analysis), in module component 10-M-GAN-1-122: Geometrische Analysis (Geometric Analysis), and in module component 10-M-PGE-1-122: Einführung in die Projektive Geometrie (Introduction to Projective Geometry):</p> <ul style="list-style-type: none">8 ECTS credits, pass / failwritten examination (approx. 90 to 180 minutes). If announced by the lecturer, 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. 30 minutes). The module component will also be considered suc-			

successfully completed if it is selected as subject of the oral examination covering several modules (separate module component for assessment purposes (Prüfungsteilmodul)) and this examination is passed.

- Language of assessment: German; English if agreed upon with examiner(s)
- Additional prerequisites: To qualify for admission to assessment, students must meet certain prerequisites. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew.

Assessment in module component 10-M-REI-P-122: Prüfung Reine Mathematik (Assessment Pure Mathematics)

- 4 ECTS credits, numerical grading
- oral examination of one candidate each (approx. 30 minutes). Assessment will have reference to the topics covered in the two module components selected by students.
- Language of assessment: German; English if agreed upon with examiner(s)
- Only after successful completion of module components: Module component 10-M-REI-P can only be taken by students who passed the written examination in one of the other six module components.

Allocation of places

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Additional information

Additional information on module duration: 1 to 2 semesters.

Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Mathematics (2012)

Bachelor' degree (1 major) Mathematics (2013)

Module title			Abbreviation
Advanced Mathematics			10-M-SPZ-122-m01
Module coordinator		Module offered by	
Dean of Studies Mathematik (Mathematics)		Institute of Mathematics	
ECTS	Method of grading	Only after succ. compl. of module(s)	
20	numerical grade	--	
Duration	Module level	Other prerequisites	
2 semester	undergraduate	By way of exception, additional prerequisites are listed in the section on assessments.	
Contents			
Two of the following topics in pure or applied mathematics which have not been chosen as subject of assessment in module 10-M-ANW or 10-M-REI: Numerical Mathematics 1 (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) Numerical Mathematics 2 (Solution methods and applications for eigenvalue problems, linear programming, initial value problems for ordinary differential equations, boundary value problems) Stochastics 1 (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) Stochastics 2 (Elements of data analysis, statistics of data in normal and other distributions, elements of multivariate statistics) Introduction to Algebra (Fundamental algebraic structures: groups, rings, fields; Galois theory) Introduction to Differential Geometry (Curves in Euclidean spaces, curvature, Frenet equations, local classification, submanifolds in Euclidean spaces, hypersurfaces in particular, curvature of hypersurfaces, geodesics, isometries, main theorem on local surface theory, special classes of surfaces) Ordinary Differential Equations (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) Introduction to Complex Analysis (Complex differentiability and Cauchy-Riemann differential equations, path integrals and Cauchy integral theorems, isolated singularities, meromorphic functions and Laurent series, residue theorem and applications, Weierstraß product theorem and theorem of Mittag-Leffler, conformal maps) Geometric Analysis (Fundamentals in analysis on manifolds, submanifolds, calculus of differential forms, Stokes's theorem and applications in vector analysis and topology) Introduction to Projective Geometry (Projective and affine planes, projective and affine spaces, theorem of Desargues, fundamental theorems for projective spaces, dualities and polarities of projective spaces) Introduction to Discrete Mathematics (Techniques from combinatorics, introduction to graph theory including applications, cryptographic methods, error-correcting codes) Introduction to Functional Analysis (Banach spaces and Hilbert spaces, bounded operators, principles of functional analysis) Operations Research (Linear programming, duality theory, transport problems, integral linear programming, graph theoretic problems) Introduction to Number Theory (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).			
Intended learning outcomes			
The student is acquainted with advanced concepts and methods of pure and/or applied mathematics. Based on these fundamental mathematical concepts and methods he/she is able to pursue further studies and interrelate these concepts, and realises the advantages of thinking across the borders of different branches in mathematics.			

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

This module has 15 components; information on courses listed separately for each component.

- 10-M-NUM-1-122, 10-M-NUM-2-122, 10-M-STO-1-122, 10-M-STO-2-122, 10-M-ALG-1-122, 10-M-DGE-1-122, 10-M-DGL-1-122, 10-M-FTH-1-122, 10-M-GAN-1-122, 10-M-PGE-1-122, 10-M-DIM-1-122, 10-M-FAN-1-122, 10-M-ORS-1-122, and 10-M-ZTH-1-122: V + Ü (no information on language and number of weekly contact hours available)
- 10-M-SPZ-P-122: M (no information on language and number of weekly contact hours available)

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

This module has the following 15 assessment components. To pass this module, students must pass one out of the 14 assessment components that are first in the list below and the assessment component that is last in the list below.

Assessment in module component 10-M-NUM-1-122: Numerische Mathematik 1 (Numerical Mathematics 1), **in module component 10-M-NUM-2-122:** Numerische Mathematik 2 (Numerical Mathematics 2), **in module component 10-M-STO-1-122:** Stochastik 1 (Stochastics 1), **in module component 10-M-STO-2-122:** Stochastik 2 (Stochastics 2), **in module component 10-M-ALG-1-122:** Einführung in die Algebra (Introduction to Algebra), **in module component 10-M-DGE-1-122:** Einführung in die Differentialgeometrie (Introduction to Differential Geometry), **in module component 10-M-DGL-1-122:** Gewöhnliche Differentialgleichungen (Ordinary Differential Equations), **in module component 10-M-FTH-1-122:** Einführung in die Funktionentheorie (Introduction to Complex Analysis), **in module component 10-M-GAN-1-122:** Geometrische Analysis (Geometric Analysis), **in module component 10-M-PGE-1-122:** Einführung in die Projektive Geometrie (Introduction to Projective Geometry), **in module component 10-M-DIM-1-122:** Einführung in die Diskrete Mathematik (Introduction to Discrete Mathematics), **in module component 10-M-FAN-1-122:** Einführung in die Funktionalanalysis (Introduction to Functional Analysis), **in module component 10-M-ORS-1-122:** Operations Research, and **in module component 10-M-ZTH-1-122:** Einführung in die Zahlentheorie (Introduction to Number Theory) :

- 8 ECTS credits, pass / fail
- written examination (approx. 90 to 180 minutes). If announced by the lecturer, 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. 30 minutes). The module component will also be considered successfully completed if it is selected as subject of the oral examination covering several modules (separate module component for assessment purposes (Prüfungsteilmodul)) and this examination is passed.
- Language of assessment: German; English if agreed upon with examiner(s)
- Additional prerequisites: To qualify for admission to assessment, students must meet certain prerequisites. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew.

Assessment in module component 10-M-ERG-P-122: Prüfung in Ergänzung Mathematik (Assessment in Selected Topics from Mathematics)

- 2 ECTS credits, numerical grading
- oral examination of one candidate each (approx. 30 minutes). Assessment will have reference to the topics covered in the module component selected by students.
- Language of assessment: German; English if agreed upon with examiner(s)
- Only after successful completion of module components: Module component 10-M-ERG-P can only be taken by students who passed the written examination in one of the other 14 module components.

Allocation of places

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Additional information

Additional information on module duration: 1 to 2 semesters.

Workload

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Teaching cycle
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Referred to in LPO I (examination regulations for teaching-degree programmes)
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Module appears in
Bachelor' degree (1 major) Mathematics (2012)
Bachelor' degree (1 major) Mathematics (2013)

Module title		Abbreviation
Advanced Analysis		10-M-VAN-122-m01
Module coordinator		Module offered by
Dean of Studies Mathematik (Mathematics)		Institute of Mathematics
ECTS	Method of grading	Only after succ. compl. of module(s)
9	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew.
Contents		
Continuation of analysis in several variables, integration theorems.		
Intended learning outcomes		
The student is acquainted with advanced topics in analysis. Taking the example of the Lebesgue integral, he or she is able to understand the construction of a complex mathematical concept.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 90 to 180 minutes) if announced by the lecturer, the written examination can be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups (groups of 2, approx. 30 minutes) Language of assessment: German, English if agreed upon with the examiner		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Mathematical Physics (2012) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013)		

Compulsory Electives

(40 ECTS credits)

Compulsory Electives Mathematics

(ECTS credits)

Module title		Abbreviation
Introduction to Stochastic Financial Mathematics		10-M-EFM-122-m01
Module coordinator		Module offered by
Dean of Studies Mathematik (Mathematics)		Institute of Mathematics
ECTS	Method of grading	Only after succ. compl. of module(s)
9	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew.
Contents		
Arbitrage and no-arbitrage, annuities and bonds, valuation of deterministic cash flows, actuarial present value, term structures and yield curves, forwards, payout profiles of options and other derivatives, fundamental theorem of asset pricing in the stochastic one-period model, risk neutral price measures, replication and completeness, stochastic multi-period models, valuation of European options in the binomial model, Black-Scholes formula.		
Intended learning outcomes		
The student is acquainted with the fundamental concepts and methods of stochastic financial mathematics, can apply them to practical problems and knows about typical fields of application.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 90 to 180 minutes) if announced by the lecturer, the written examination can be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups (groups of 2, approx. 30 minutes) Language of assessment: German, English if agreed upon with the examiner		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Economathematics (2012)		
Bachelor's with 1 major Mathematics (2012)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Mathematik - 2012	page 24 / 237

Module title			Abbreviation
Selected Topics from Mathematics			10-M-ERG-122-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	
2 semester	undergraduate	By way of exception, additional prerequisites are listed in the section on assessments.	
Contents			
<p>One of the following topics in pure or applied mathematics which has not been chosen as subject of assessment in modules 10-M-REI, 10-M-ANW and 10-M-SPZ:</p> <p>Numerical Mathematics 1 (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)</p> <p>Numerical Mathematics 2 (Solution methods and applications for eigenvalue problems, linear programming, initial value problems for ordinary differential equations, boundary value problems)</p> <p>Stochastics 1 (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)</p> <p>Stochastics 2 (Elements of data analysis, statistics of data in normal and other distributions, elements of multivariate statistics)</p> <p>Introduction to Algebra (Fundamental algebraic structures: groups, rings, fields; Galois theory)</p> <p>Introduction to Differential Geometry (Curves in Euclidean spaces, curvature, Frenet equations, local classification, submanifolds in Euclidean spaces, hypersurfaces in particular, curvature of hypersurfaces, geodesics, isometries, main theorem on local surface theory, special classes of surfaces)</p> <p>Ordinary Differential Equations (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)</p> <p>Introduction to Complex Analysis (Complex differentiability and Cauchy-Riemann differential equations, path integrals and Cauchy integral theorems, isolated singularities, meromorphic functions and Laurent series, residue theorem and applications, Weierstraß product theorem and theorem of Mittag-Leffler, conformal maps)</p> <p>Geometric Analysis (Fundamentals in analysis on manifolds, submanifolds, calculus of differential forms, Stoke's theorem and applications in vector analysis and topology)</p> <p>Introduction to Projective Geometry (Projective and affine planes, projective and affine spaces, theorem of Desargues, fundamental theorems for projective spaces, dualities and polarities of projective spaces)</p> <p>Introduction to Discrete Mathematics (Techniques from combinatorics, introduction to graph theory including applications, cryptographic methods, error-correcting codes)</p> <p>Introduction to Functional Analysis (Banach spaces and Hilbert spaces, bounded operators, principles of functional analysis)</p> <p>Operations Research (Linear programming, duality theory, transport problems, integral linear programming, graph theoretic problems)</p> <p>Introduction to Number Theory (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).</p>			
Intended learning outcomes			
The student is acquainted with advanced concepts and methods of pure and/or applied mathematics. Based on these fundamental mathematical concepts and methods he/she is able to persue further studies and interrelate these concepts, and he/she knows about interrelations of the acquired knowledge.			
Courses (type, number of weekly contact hours, language — if other than German)			
This module has 15 components; information on courses listed separately for each component.			
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- 10-M-NUM-1-122, 10-M-NUM-2-122, 10-M-STO-1-122, 10-M-STO-2-122, 10-M-ALG-1-122, 10-M-DGE-1-122, 10-M-DGL-1-122, 10-M-FTH-1-122, 10-M-GAN-1-122, 10-M-PGE-1-122, 10-M-DIM-1-122, 10-M-FAN-1-122, 10-M-ORS-1-122, and 10-M-ZTH-1-122: V + Ü (no information on language and number of weekly contact hours available)
- 10-M-ERG-P-122: M (no information on language and number of weekly contact hours available)

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

This module has the following 15 assessment components. To pass this module, students must pass one out of the 14 assessment components that are first in the list below and the assessment component that is last in the list below.

Assessment in module component 10-M-NUM-1-122: Numerische Mathematik 1 (Numerical Mathematics 1), **in module component 10-M-NUM-2-122:** Numerische Mathematik 2 (Numerical Mathematics 2), **in module component 10-M-STO-1-122:** Stochastik 1 (Stochastics 1), **in module component 10-M-STO-2-122:** Stochastik 2 (Stochastics 2), **in module component 10-M-ALG-1-122:** Einführung in die Algebra (Introduction to Algebra), **in module component 10-M-DGE-1-122:** Einführung in die Differentialgeometrie (Introduction to Differential Geometry), **in module component 10-M-DGL-1-122:** Gewöhnliche Differentialgleichungen (Ordinary Differential Equations), **in module component 10-M-FTH-1-122:** Einführung in die Funktionentheorie (Introduction to Complex Analysis), **in module component 10-M-GAN-1-122:** Geometrische Analysis (Geometric Analysis), **in module component 10-M-PGE-1-122:** Einführung in die Projektive Geometrie (Introduction to Projective Geometry), **in module component 10-M-DIM-1-122:** Einführung in die Diskrete Mathematik (Introduction to Discrete Mathematics), **in module component 10-M-FAN-1-122:** Einführung in die Funktionalanalysis (Introduction to Functional Analysis), **in module component 10-M-ORS-1-122:** Operations Research, and **in module component 10-M-ZTH-1-122:** Einführung in die Zahlentheorie (Introduction to Number Theory) :

- 8 ECTS credits, pass / fail
- written examination (approx. 90 to 180 minutes). If announced by the lecturer, 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. 30 minutes). The module component will also be considered successfully completed if it is selected as subject of the oral examination covering several modules (separate module component for assessment purposes (Prüfungsteilmodul)) and this examination is passed.
- Language of assessment: German; English if agreed upon with examiner(s)
- Additional prerequisites: To qualify for admission to assessment, students must meet certain prerequisites. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew.

Assessment in module component 10-M-SPZ-P-122: Prüfung in Spezialisierung Mathematik (Assessment in Advanced Mathematics)

- 4 ECTS credits, numerical grading
- oral examination of one candidate each (approx. 30 minutes). Assessment will have reference to the topics covered in the two module components selected by students.
- Language of assessment: German; English if agreed upon with examiner(s)
- Only after successful completion of module components: Module component 10-M-SPZ-P can only be taken by students who passed the written examination in one of the other 14 module components.

Allocation of places

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Additional information

Additional information on module duration: 1 to 2 semesters.

Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Mathematics (2012)

Bachelor' degree (1 major) Mathematics (2013)

Module title		Abbreviation
Mathematics in Culture and Society		10-M-MKG-122-m01
Module coordinator		Module offered by
Dean of Studies Mathematik (Mathematics)		Institute of Mathematics
ECTS	Method of grading	Only after succ. compl. of module(s)
8	(not) successfully completed	--
Duration	Module level	Other prerequisites
2 semester	undergraduate	By way of exception, additional prerequisites are listed in the section on assessments.
Contents		
Historical and cultural development as well as social relevance of mathematics; more in-depth discussion of the fundamentals of mathematics, in particular in its relation to other sciences and humanities as well as to the image of mathematics in modern society.		
Intended learning outcomes		
Based on selected examples, the student has gained insight into the historical and cultural genesis of mathematical theories and their social relevance. He/she is able to present mathematical ideas and concepts to a general audience.		
Courses (type, number of weekly contact hours, language — if other than German)		
This module has 4 components; information on courses listed separately for each component. <ul style="list-style-type: none"> 10-M-GES-1-122, 10-M-MSc-1-122, and 10-M-SCH-1-122: V + Ü (no information on language and number of weekly contact hours available) 10-M-PRO-1-122: S (no information on language and number of weekly contact hours available) 		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
This module has the following 4 assessment components. To pass the module as a whole students must pass two of the four assessment components.		
<p>Assessment in module component 10-M-GES-1-122: Ausgewählte Kapitel aus der Geschichte der Mathematik (Selected Topics from the History of Mathematics), in module component 10-M-MSc-1-122: Mathematisches Schreiben (Mathematical Writing), and in module component 10-M-SCH-1-122: Schulmathematik vom höheren Standpunkt (School Mathematics from a Higher Perspective) :</p> <ul style="list-style-type: none"> 4 ECTS credits, pass / fail project assignments (type and expenditure of time to be specified by the lecturer at the beginning of the course) Assessment will be offered in the semester in which the course is offered and in the subsequent semester. Language of assessment: German; English if agreed upon with examiner(s) Additional prerequisites: To qualify for admission to assessment, students must meet certain prerequisites. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew. <p>Assessment in module component 10-M-PRO-1-122: Proseminar Mathematik (Proseminar Mathematics)</p> <ul style="list-style-type: none"> 4 ECTS credits, pass / fail talk (approx. 60 to 180 minutes) Assessment will be offered in the semester in which the course is offered and in the subsequent semester. Language of assessment: German; English if agreed upon with examiner(s) Additional prerequisites: To qualify for admission to assessment, students must meet certain prerequisites. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If stu- 		
Bachelor's with 1 major Mathematics (2012)		JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Mathematik - 2012
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dents have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew.

Allocation of places

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Additional information

Additional information on module duration: 1 to 2 semesters.

Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Mathematics (2012)
Bachelor' degree (1 major) Mathematics (2013)
Bachelor' degree (1 major) Computational Mathematics (2012)
Bachelor' degree (1 major) Computational Mathematics (2013)
First state examination for the teaching degree Gymnasium Mathematics (2012)

Module title		Abbreviation
Additional Seminar in Mathematics		10-M-SE2-122-m01
Module coordinator		Module offered by
Dean of Studies Mathematik (Mathematics)		Institute of Mathematics
ECTS	Method of grading	Only after succ. compl. of module(s)
5	(not) successfully completed	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew.
Contents		
An additional selected topic in mathematics.		
Intended learning outcomes		
The student gains first experience with independent scientific work. He/She masters elaboration and structuring of a given topic using selected literature, and prepares a talk on the subject. He/She is able to participate actively in a scientific discussion.		
Courses (type, number of weekly contact hours, language — if other than German)		
S (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
talk (approx. 60 to 180 minutes) Language of assessment: German, English if agreed upon with the examiner		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013)		

Application-oriented Subject

(30 ECTS credits)

Students must take one of the following application-oriented subjects, each with the specified mandatory courses and/or mandatory electives: Biologie (Biology), Chemie (Chemistry), Geographie (Geography), Informatik (Computer Science), Philosophie (Philosophy), Physik (Physics), Wirtschaftswissenschaft (Business Management and Economics).

Application-oriented Subject Biology

(40 ECTS credits)

Application-oriented Subject Biology Compulsory Electives

(20 ECTS credits)

Module title		Abbreviation
Genetics, Neurobiology, Behaviour		07-2A2GNV-072-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	By way of exception, additional prerequisites are listed in the section on assessments.
Contents		
Fundamental principles of genetics, neurobiology and behavioural biology.		
Intended learning outcomes		
[Version 1: 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.] [Version 2: 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.]		
Courses (type, number of weekly contact hours, language — if other than German)		
This module comprises 3 module components. Information on courses will be listed separately for each module component. <ul style="list-style-type: none"> 07-2A2GNV-1G-072: V + Ü (no information on SWS (weekly contact hours) and course language available) 07-2A2GNV-2N-072: V + Ü (no information on SWS (weekly contact hours) and course language available) 07-2A2GNV-3V-072: V + Ü (no information on SWS (weekly contact hours) and course language available) 		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
Assessment in this module comprises the assessments in the individual module components as specified below. Unless stated otherwise, successful completion of the module will require successful completion of all individual assessments.		
Assessment in module component 07-2A2GNV-1G-072: Basic Genetics Basic Genetics <ul style="list-style-type: none"> 2 ECTS, Method of grading: numerical grade written examination (approx. 30 minutes) Other prerequisites: Admission prerequisite to assessment: regular attendance of exercises and successful completion of the respective exercises as specified at the beginning of the course. 		
Assessment in module component 07-2A2GNV-2N-072: Basic Neurobiology Basic Neurobiology <ul style="list-style-type: none"> 2 ECTS, Method of grading: numerical grade written examination (approx. 30 minutes) Other prerequisites: Admission prerequisite to assessment: regular attendance of exercises and successful completion of the respective exercises as specified at the beginning of the course. 		
Assessment in module component 07-2A2GNV-3V-072: Behavioural Biology Behavioural Biology <ul style="list-style-type: none"> 2 ECTS, Method of grading: numerical grade written examination (approx. 30 minutes, word problems and/or multiple choice questions) Other prerequisites: Admission prerequisite to assessment: regular attendance of exercises and successful completion of the respective exercises as specified at the beginning of the course. 		
Allocation of places		
Only as part of "spezielles Studienangebot": 10 places.		
Additional information		
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Workload
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Teaching cycle
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Referred to in LPO I (examination regulations for teaching-degree programmes)
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Module appears in
<p>Bachelor' degree (1 major) Biology (2011)</p> <p>Bachelor' degree (1 major) Biology (2007)</p> <p>Bachelor' degree (1 major) Biology (2010)</p> <p>Bachelor' degree (1 major) Mathematics (2008)</p> <p>Bachelor' degree (1 major) Mathematics (2012)</p> <p>Bachelor' degree (1 major) Mathematics (2013)</p> <p>Bachelor' degree (1 major) Mathematics (2007)</p> <p>Bachelor' degree (1 major) Computational Mathematics (2009)</p> <p>Bachelor' degree (1 major) Computational Mathematics (2012)</p> <p>Bachelor' degree (1 major) Computational Mathematics (2013)</p> <p>Bachelor's degree (1 major, 1 minor) Biology (Minor, 2008)</p> <p>Bachelor's degree (1 major, 1 minor) Biology (Minor, 2010)</p> <p>No final examination Special study offering (2010)</p>

Module title		Abbreviation
Mathematical Biology and Biostatistics		07-2BM-072-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	Admission prerequisite to assessment: regular attendance of exercises and successful completion of the respective exercises as specified at the beginning of the course.
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 + Ü (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 45 minutes) including multiple choice questions		
Allocation of places		
Only as part of "spezielles Studienangebot": 30 places.		
Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Biochemistry (2011) Bachelor' degree (1 major) Biochemistry (2009) Bachelor' degree (1 major) Biology (2011) Bachelor' degree (1 major) Biology (2007) Bachelor' degree (1 major) Biology (2010) Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) Bachelor's degree (1 major, 1 minor) Biology (Minor, 2008) Bachelor's degree (1 major, 1 minor) Biology (Minor, 2010) No final examination Special study offering (2010)		

Module title		Abbreviation
Plant and Animal Ecology		07-3A3OE-102-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	By way of exception, additional prerequisites are listed in the section on assessments.
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 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)		
This module comprises 2 module components. Information on courses will be listed separately for each module component. <ul style="list-style-type: none"> • 07-3A3OE-1-102: V + Ü (no information on SWS (weekly contact hours) and course language available) • 07-3A3OE-2-102: V + Ü (no information on SWS (weekly contact hours) and course language available) 		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
Assessment in this module comprises the assessments in the individual module components as specified below. Unless stated otherwise, successful completion of the module will require successful completion of all individual assessments.		
Assessment in module component 07-3A3OE-1-102: Animal Ecology <ul style="list-style-type: none"> • 3 ECTS, Method of grading: numerical grade • written examination (approx. 45 minutes) • Other prerequisites: Admission prerequisite to assessment: regular attendance of exercises and successful completion of the respective exercises as specified at the beginning of the course. Assessment in module component 07-3A3OE-2-102: Plant Ecology <ul style="list-style-type: none"> • 3 ECTS, Method of grading: numerical grade • written examination (approx. 45 minutes) • Other prerequisites: Admission prerequisite to assessment: regular attendance of exercises and successful completion of the respective exercises as specified at the beginning of the course. 		
Allocation of places		
Only as part of pool of general key skills (ASQ): 15 places. Places will be allocated by lot.		
Additional information		
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Workload		
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Teaching cycle
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Referred to in LPO I (examination regulations for teaching-degree programmes)
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Module appears in
<p>Bachelor' degree (1 major) Biology (2011)</p> <p>Bachelor' degree (1 major) Biology (2010)</p> <p>Bachelor' degree (1 major) Mathematics (2012)</p> <p>Bachelor' degree (1 major) Mathematics (2013)</p> <p>Bachelor' degree (1 major) Computational Mathematics (2012)</p> <p>Bachelor' degree (1 major) Computational Mathematics (2013)</p> <p>Bachelor's degree (1 major, 1 minor) Biology (Minor, 2010)</p> <p>No final examination Special study offering (2010)</p>

Module title		Abbreviation
From Cells to Organisms for minor field of study		07-1A1ZO-NF-102-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)
10	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	By way of exception, additional prerequisites are listed in the section on assessments.
Contents		
<p>The first part of the course will acquaint students with the elementary building blocks of life as well as biological categories. Building on this knowledge, the course will then discuss the cell, the smallest unit of life, starting with its macroscopic structure before moving on to its microscopic structure. The course will point out differences and similarities between prokaryotic cells (bacteria, archaeobacteria) and eukaryotic cells (animals, plants). The second part will address one of the central issues of biology: evolution. Fundamental mechanisms and hypotheses will be discussed and students will be introduced to major phylogenetic reconstruction methods. Using the examples of plants and animals, the subsequent module components will introduce students to the phylogenetic diversity of eukaryotes. At the level of groups in the plant and animal kingdoms, students will acquire the fundamental knowledge necessary to understand the forms and functions of animal and plant organisms, with morphology and cytology being discussed in an evolutionary and ecological context. The contents of the module are relevant for biological disciplines at all levels of biological organisation.</p>		
Intended learning outcomes		
<p>- Knowledge of the structures of prokaryotic and eukaryotic cells and their (biological) macromolecules. - Knowledge of the specific characteristics of the intracellular and extracellular structures of prokaryotes as well as animal and plant cells. - Ability to recognise evolution as the driving force behind the phylogeny of species. - Familiarity with the concepts of phylogenetic relationships between plants/animals. - Familiarity with the distinguishing characteristics and major representatives of groups in the plant and animal kingdoms. - Ability to select those plant and animal organisms that are most suitable for particular scientific issues. - Familiarity with the components and functioning of microscopes.</p>		
Courses (type, number of weekly contact hours, language — if other than German)		
<p>This module has 4 components; information on courses listed separately for each component.</p> <ul style="list-style-type: none"> • 07-1A1ZO-3P-072, 07-1A1ZO-4T-072, and 07-1A1ZO-2E-102: V + Ü (no information on language and number of weekly contact hours available) • 07-1A1ZO-NF-1Z-082: V (no information on language and number of weekly contact hours available) 		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
<p>This module has the following 4 assessment components. Unless stated otherwise, students must pass all of these assessment components to pass the module as a whole.</p> <p>Assessment in module component 07-1A1ZO-3P-072: Das Pflanzenreich (The Plant Kingdom)</p> <ul style="list-style-type: none"> • 4 ECTS credits, numerical grading • written examination (approx. 60 minutes) • Additional prerequisites: admission prerequisite to assessment: regular attendance of exercises as well as successful completion of the respective exercises. <p>Assessment in module component 07-1A1ZO-4T-072: Das Tierreich (The Animal Kingdom)</p> <ul style="list-style-type: none"> • 4 ECTS credits, numerical grading • written examination (approx. 60 minutes) • Additional prerequisites: admission prerequisite to assessment: regular attendance of and participation in exercises as well as successful completion of the respective exercises as specified at the beginning of the course. 		

Assessment in module component 07-1A1ZO-NF-1Z-082: Die Zelle für das Nebenfach Biologie (The Cell for Biology Minors)

- 1 ECTS credit, numerical grading
- written examination (approx. 60 minutes) including multiple choice questions

Assessment in module component 07-1A1ZO-2E-102: Evolution

- 1 ECTS credit, pass / fail
- written examination (approx. 30 minutes, including multiple choice questions)
- Additional prerequisites: admission prerequisite to assessment: regular attendance of exercises and successful completion of the respective exercises as specified at the beginning of the course.

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Mathematics (2012)
 Bachelor' degree (1 major) Mathematics (2013)
 Bachelor' degree (1 major) Computational Mathematics (2012)
 Bachelor' degree (1 major) Computational Mathematics (2013)
 Bachelor's degree (1 major, 1 minor) Biology (Minor, 2010)

Module title		Abbreviation
Developmental Biology of Animals		07-3A3EBIOT-102-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)
4	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: regular attendance of exercises and successful completion of the respective exercises as specified at the beginning of the course.
Contents		
In this module, students will acquire theoretical and practical background knowledge on animal developmental biology. The following topics will be covered: early embryonic development of various model organisms (amphibians, nematodes, Drosophila, mouse) and relevance for the systematics of animals, gametogenesis (production of spermatozoa and ova), differential gene expression, cell growth and molecular regulation of cell development, organogenesis, pattern formation, carcinogenesis, stem cell research and cloning, metamorphosis (amphibians, insects), eco-devo, evo-devo.		
Intended learning outcomes		
1. Fundamental concepts in developmental biology. 2. Embryonic and postembryonic development of selected model organisms (pattern formation). 3. Molecular mechanisms as well as control of cell development. 4. Interdisciplinary connections between developmental biology and other branches of biology. 5. Cell biology of cotyledon, cancer and stem cells as well as gametes. 6. Interrelations between ontogeny and evolution/environment. 7. Physiological aspects of the developmental processes discussed.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 30 to 60 minutes) including multiple choice questions		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Biomedicine (2009) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) Bachelor's degree (1 major, 1 minor) Biology (Minor, 2010)		

Application-oriented Subject Biology Compulsory Electives 2

(20 ECTS credits)

When taking up their studies, students are highly recommended to consult with the course advisory service Biology that will help them choose appropriate modules from the list below. Modules from the areas "Spezielle Biowissenschaften I / II" ("Specific Biosciences I / II") may only be used by students who achieved no less than 14 ECTS credits in the area of mandatory electives 1 beforehand.

Module title			Abbreviation
Functional Morphology of arthropods			07-4S1NVO3-092-m01
Module coordinator		Module offered by	
holder of the Chair of Zoology III		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: regular attendance of exercises and successful completion of the respective exercises as specified at the beginning of the course.	
Contents			
Morphology, anatomy, phylogeny and ecology of arthropods.			
Intended learning outcomes			
Students are able to explain arthropod radiations in a functional context as well as to explain the importance of arthropods to ecosystems.			
Courses (type, number of weekly contact hours, language — if other than German)			
V + Ü (no information on SWS (weekly contact hours) and course language available)			
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)			
term paper (approx. 5 to 10 pages)			
Allocation of places			
Number of places: 20. Should the number of applications exceed the number of available places, places will be allocated as follows: Places will primarily be allocated to students of the Bachelor's degree subject Biologie (Biology) with 180 ECTS credits. Should the module be used in other subjects, there will be two quotas: 95% of places will be allocated to students of the Bachelor's degree subject Biologie (Biology) with 180 ECTS credits and 5% of places (a minimum of one participant in total) will be allocated to students of the Bachelor's degree subject Biologie (Biology) with 60 ECTS credits and to students of the Bachelor's degree subjects Computational Mathematics and Mathematik (Mathematics), each with 180 ECTS credits, as part of the application-oriented subject Biology (as well as potentially to students of other 'importing' subjects). Should the number of places available in one quota exceed the number of applications, the remaining places will be allocated to applicants from the other quota. Should there be, within one module component, several courses with a restricted number of places, there will be a uniform regulation for the courses of one module component. In this case, places on all courses of a module component that are concerned will be allocated in a standardised procedure. In this procedure, applicants who already have successfully completed at least one other module component of the respective module will be given preferential consideration. A waiting list will be maintained and places re-allocated as they become available. Selection process group 1 (95%): Places will primarily be allocated according to the applicants' previous academic achievements. For this purpose, applicants will be ranked according to the number of ECTS credits they have achieved and their average grade of all assessments taken during their studies or of all module components in the subject of Biologie (Biology) (excluding Chemie (Chemistry), Physik (Physics), Mathematik (Mathematics)) at the time of application. This will be done as follows: First, applicants will be ranked, firstly, according to their average grade weighted according to the number of ECTS credits (qualitative ranking) and, secondly, according to their total number of ECTS credits achieved (quantitative ranking). The applicants' position in a third ranking will be calculated as the sum of these two rankings, and places will be allocated according to this third ranking. Among applicants with the same ranking, places will be allocated according to the qualitative ranking or otherwise by lot. Selection process group 2 (5%): Places will be allocated according to the following quotas: Quota 1 (50% of places): total number of ECTS credits already achieved in modules/module components of the Faculty of Biology; among applicants with the same number of ECTS credits achieved, places will be allocated by lot. Quota 2 (25% of places): number of subject semesters of the respective applicant; among applicants with the same number of subject semesters, places will be allocated by lot. Quota 3 (25% of			

places): allocation by lot. Should the module be used only in the Bachelor's degree subject Biologie (Biology) with 180 ECTS credits, places will be allocated according to the selection process of group 1.

Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Biology (2011)
Bachelor' degree (1 major) Biology (2007)
Bachelor' degree (1 major) Biology (2010)
Bachelor' degree (1 major) Mathematics (2012)
Bachelor' degree (1 major) Mathematics (2013)
Bachelor' degree (1 major) Mathematics (2007)
Bachelor' degree (1 major) Computational Mathematics (2012)
Bachelor' degree (1 major) Computational Mathematics (2013)
Bachelor's degree (1 major, 1 minor) Biology (Minor, 2008)
Bachelor's degree (1 major, 1 minor) Biology (Minor, 2010)

Module title		Abbreviation
Basic Physiology of Animals for minor field of study		07-2A2TP-NF-082-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)
3	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: regular attendance of exercises and successful completion of the respective exercises as specified at the beginning of the course.
Contents		
This module will acquaint students with the principles of general and comparative plant physiology and will provide them with an opportunity to develop the fundamental skills for working in a physiological laboratory. The module will discuss the physiological processes that regulate the internal environment of animals.		
Intended learning outcomes		
Students have developed an understanding of the physiological functions and regulation of organisms. They have acquired fundamental knowledge on planning, setup, interpretation and presentation of scientific results.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 60 minutes, word problems and/or multiple choice questions)		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) Bachelor's degree (1 major, 1 minor) Biology (Minor, 2008) Bachelor's degree (1 major, 1 minor) Biology (Minor, 2010)		

Module title		Abbreviation
Basic Physiology of Prokaryotes for minor field of study		07-2A2PPR-NF-o82-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)
3	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	--
Contents		
This module will acquaint students with the principles of prokaryotic physiology. It will discuss prokaryotic metabolic diversity.		
Intended learning outcomes		
Students have developed an understanding of the physiological functions and regulation of organisms. They have acquired fundamental knowledge on planning, setup, interpretation and presentation of scientific results.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 60 minutes) including multiple choice questions		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) Bachelor's degree (1 major, 1 minor) Biology (Minor, 2008) Bachelor's degree (1 major, 1 minor) Biology (Minor, 2010)		

Module title		Abbreviation
Basic Physiology of Plants for minor field of study		07-2A2PPF-NF-o82-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)
3	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: regular attendance of exercises and successful completion of the respective exercises as specified at the beginning of the course.
Contents		
This module will acquaint students with the principles of general and comparative plant physiology and will provide them with an opportunity to develop the fundamental skills for working in a physiological laboratory. The module will discuss the physiological processes that regulate the internal environment of plants.		
Intended learning outcomes		
Students have developed an understanding of the physiological functions and regulation of organisms. They have acquired fundamental knowledge on planning, setup, interpretation and presentation of scientific results.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 45 minutes)		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) Bachelor's degree (1 major, 1 minor) Biology (Minor, 2008) Bachelor's degree (1 major, 1 minor) Biology (Minor, 2010)		

Module title			Abbreviation
Genes, Molecules, Technologies			07-3A3GMT-102-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 component <i>Spezielle Genetik (Special Genetics)</i> will build on <i>Einführung in die Genetik (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 module component <i>Einführung in die Bioinformatik (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. In the module component <i>Einführung in die Biotechnologie (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 module component <i>Einführung in die Pharmakokinetik (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>Module component <i>Spezielle Genetik (Special Genetics)</i>: Advanced knowledge on genome evolution and the regulation of gene expression. Essential knowledge on current methods in genetics. Module component <i>Einführung in die Biotechnologie (Introduction to Biotechnology)</i>: Students will acquire an overview of both traditional and modern methods in biotechnology and will become familiar with fundamental topics in biotechnology. Module component <i>Einführung in die Biotechnologie (Introduction to Biotechnology)</i>: Students will acquire an overview of both traditional and modern methods in biotechnology and will become familiar with fundamental topics in biotechnology. Module component <i>Einführung in die Pharmakokinetik (Introduction to Pharmacokinetics)</i>: Students will acquire an overview of the fundamental principles of the development and review of active agents in research, clinical practice and the pharmaceutical industry. Optimisation of active agents with regard to absorption, distribution, metabolism and elimination takes place during the early stages of active agent development. The course will equip students with fundamental knowledge that will enable them to predict, on the basis of the structure and physicochemical properties of a small molecule or protein, whether the molecule or protein is suitable as an active agent as well as to predict the fate of the respective active agent in an organism.</p>			
Courses (type, number of weekly contact hours, language — if other than German)			
<p>This module has 4 components; information on courses listed separately for each component.</p> <ul style="list-style-type: none">07-3A3GMT-1-102, 07-3A3GMT-2-102, 07-3A3GMT-3-102, and 07-3A3GMT-4-102: V (no information on language and number of weekly contact hours available)			
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)			
<p>This module has the following 4 assessment components. Unless stated otherwise, students must pass all of these assessment components to pass the module as a whole.</p> <p>Assessment in module component 07-3A3GMT-1-102: Genetik (Genetics), in module component 07-3A3GMT-2-102: Bioinformatik (Bioinformatics), in module component 07-3A3GMT-3-102: Biotechnologie (Biotechnology), and in module component 07-3A3GMT-4-102: Pharmakokinetik (Pharmacokinetics) :</p>			
Bachelor's with 1 major Mathematics (2012)		JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Mathematik - 2012	page 48 / 237

<ul style="list-style-type: none"> • 1.5 ECTS credits, numerical grading • written examination (approx. 30 minutes, including multiple choice questions)
Allocation of places
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Additional information
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Workload
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Teaching cycle
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Referred to in LPO I (examination regulations for teaching-degree programmes)
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Module appears in
Bachelor' degree (1 major) Biology (2011) Bachelor' degree (1 major) Biology (2010) Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) Bachelor's degree (1 major, 1 minor) Biology (Minor, 2010)

Module title		Abbreviation
Principles of Biochemistry		07-3A3BC-102-m01
Module coordinator		Module offered by
holder of the Chair of Plant Physiology and Biophysics		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	Admission prerequisite to assessment: regular attendance of exercises and successful completion of the respective exercises as specified at the beginning of the course.
Contents		
With the module component <i>Makromoleküle (Macromolecules)</i> as a starting point, the lecture will provide students with deeper insights into the molecular biology and biochemistry of prokaryotes and eukaryotes. Students will become familiar with fundamental principles of molecular biology (replication, transcription, splicing and translation) and the biochemistry of carbohydrates, lipids, proteins and nucleic acids. Experiments will be performed on selected topics that were discussed in the lecture. The exercise will cover practical aspects of lab work (PCR, DNA and protein gel electrophoresis, blot, enzyme kinetics and detection, protein isolation).		
Intended learning outcomes		
Students are familiar with the fundamental principles of biochemistry.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 30 to 60 minutes) including multiple choice questions		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Biology (2011) Bachelor' degree (1 major) Biology (2010) Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) Bachelor's degree (1 major, 1 minor) Biology (Minor, 2010)		

Module title			Abbreviation
The Flora of Germany			07-4A4FL-102-m01
Module coordinator		Module offered by	
holder of the Chair of Ecophysiology and Vegetation Ecology		Faculty of Biology	
ECTS	Method of grading	Only after succ. compl. of module(s)	
7	numerical grade	--	
Duration	Module level	Other prerequisites	
1 semester	undergraduate	By way of exception, additional prerequisites are listed in the section on assessments.	
Contents			
The module will discuss the fundamental principles of the systematics and ecology of flowering plants. Students will acquire an overview of the major flowering plants to be found in the temperate zone as well as their ecological and economic importance. Using the field guide <i>Flora von Deutschland</i> by Schmeil-Fitschen, the course will demonstrate how dichotomous keys are used, and students will practise identifying freshly-gathered plants using dichotomous keys. Identifying plants, students will learn how to identify major morphological plant characteristics and will become familiar with the respective terminology. The module will also include field trips to typical habitats in the Botanical Garden and the vicinity of Würzburg. Students will become familiar with the common as well as scientific names of the plants found and will be introduced to the family- as well as species-specific characteristics of these plants. Students will practise using field guides and identification keys on site. Habitat ecological, geobotanical, climatic as well as conservation-relevant characteristics will also be discussed. The module will also include sessions at the Botanical Garden of the University of Würzburg with its outdoor facilities and greenhouses to help students acquire species identification skills.			
Intended learning outcomes			
Students have acquired knowledge and skills related to the ecology, systematics and taxonomy of indigenous flowering plants. They are familiar with the terminology of plant morphology and know how to use Floras and set up scientific herbaria.			
Courses (type, number of weekly contact hours, language — if other than German)			
This module comprises 2 module components. Information on courses will be listed separately for each module component. <ul style="list-style-type: none">07-4A4FL-1-102: V + Ü (no information on SWS (weekly contact hours) and course language available)07-4A4FL-2-102: E (no information on SWS (weekly contact hours) and course language available)			
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)			
Assessment in this module comprises the assessments in the individual module components as specified below. Unless stated otherwise, successful completion of the module will require successful completion of all individual assessments.			
Assessment in module component 07-4A4FL-1-102: Introduction to the Flora of Germany Introduction to the Flora of Germany <ul style="list-style-type: none">4 ECTS, Method of grading: numerical gradewritten examination (approx. 45 minutes) and practical identification assignment (approx. 45 minutes), weighted 1:1Assessment offered: once a year, summer semesterOther prerequisites: Admission prerequisite to assessment: regular attendance of exercises and successful completion of the respective exercises (particular emphasis to be placed on the setting up a herbarium) as specified at the beginning of the course.			
Assessment in module component 07-4A4FL-2-102: Field Excursions on the Flora of Germany <ul style="list-style-type: none">3 ECTS, Method of grading: (not) successfully completedlog (approx. 1 to 2 pages per field trip)Assessment offered: once a year, summer semester			
Bachelor's with 1 major Mathematics (2012)		JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Mathematik - 2012	
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Allocation of places

Number of places: 180. Should the number of applications exceed the number of available places, places will be allocated as follows: Places will primarily be allocated to students of the Bachelor's degree subject Biologie (Biology) with 180 ECTS credits. Should the module be used in other subjects, there will be two quotas: 95% of places will be allocated to students of the Bachelor's degree subject Biologie (Biology) with 180 ECTS credits and 5% of places (a minimum of one participant in total) will be allocated to students of the Bachelor's degree subject Biologie (Biology) with 60 ECTS credits and to students of the Bachelor's degree subjects Computational Mathematics and Mathematik (Mathematics), each with 180 ECTS credits, as part of the application-oriented subject Biology (as well as potentially to students of other 'importing' subjects). Should the number of places available in one quota exceed the number of applications, the remaining places will be allocated to applicants from the other quota. Should there be, within one module component, several courses with a restricted number of places, there will be a uniform regulation for the courses of one module component. In this case, places on all courses of a module component that are concerned will be allocated in a standardised procedure. In this procedure, applicants who already have successfully completed at least one other module component of the respective module will be given preferential consideration. A waiting list will be maintained and places re-allocated as they become available. Selection process group 1 (95%): Places will primarily be allocated according to the applicants' previous academic achievements. For this purpose, applicants will be ranked according to the number of ECTS credits they have achieved and their average grade of all assessments taken during their studies or of all module components in the subject of Biologie (Biology) (excluding Chemie (Chemistry), Physik (Physics), Mathematik (Mathematics)) at the time of application. This will be done as follows: First, applicants will be ranked, firstly, according to their average grade weighted according to the number of ECTS credits (qualitative ranking) and, secondly, according to their total number of ECTS credits achieved (quantitative ranking). The applicants' position in a third ranking will be calculated as the sum of these two rankings, and places will be allocated according to this third ranking. Among applicants with the same ranking, places will be allocated according to the qualitative ranking or otherwise by lot. Selection process group 2 (5%): Places will be allocated according to the following quotas: Quota 1 (50% of places): total number of ECTS credits already achieved in modules/module components of the Faculty of Biology; among applicants with the same number of ECTS credits achieved, places will be allocated by lot. Quota 2 (25% of places): number of subject semesters of the respective applicant; among applicants with the same number of subject semesters, places will be allocated by lot. Quota 3 (25% of places): allocation by lot. Should the module be used only in the Bachelor's degree subject Biologie (Biology) with 180 ECTS credits, places will be allocated according to the selection process of group 1.

Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Biology (2011)
Bachelor' degree (1 major) Biology (2010)
Bachelor' degree (1 major) Geography (2010)
Bachelor' degree (1 major) Mathematics (2012)
Bachelor' degree (1 major) Mathematics (2013)
Bachelor' degree (1 major) Computational Mathematics (2012)
Bachelor' degree (1 major) Computational Mathematics (2013)
Bachelor's degree (1 major, 1 minor) Biology (Minor, 2010)

Module title		Abbreviation
The Fauna of Germany		07-4A4FA-102-m01
Module coordinator		Module offered by
holder of the Chair of Animal Ecology and Tropical Biology		Faculty of Biology
ECTS	Method of grading	Only after succ. compl. of module(s)
7	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	By way of exception, additional prerequisites are listed in the section on assessments.
Contents		
<p>In this module, students will acquire an overview of selected groups of animals to be found in Central Europe. They will acquire a fundamental knowledge of the systematics and taxonomy as well as on the quantitative recording of biodiversity and will practise identifying species, using specimens of animals. Selection of specimens will be taxon-specific and will represent specific habitats or lifestyles. Field exercises in a variety of habitats will provide students with an opportunity to consolidate the knowledge and skills they acquired in the lab by identifying living specimens including their ecology and behavioural biology.</p>		
Intended learning outcomes		
<p>Students know how to taxonomically classify selected representatives of the indigenous fauna (vertebrates, invertebrates) and use identification keys. They are familiar with selected Central European habitats as well as their faunas and phenology. On the basis of the morphology and habitats of species, students are able to predict the biology and ecology of these species as well as, where applicable, to predict whether they function as indicators and are of conservation concern.</p>		
Courses (type, number of weekly contact hours, language — if other than German)		
<p>This module comprises 2 module components. Information on courses will be listed separately for each module component.</p> <ul style="list-style-type: none"> • 07-4A4FA-1-102: V + Ü (no information on SWS (weekly contact hours) and course language available) • 07-4A4FA-2-102: E (no information on SWS (weekly contact hours) and course language available) 		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
<p>Assessment in this module comprises the assessments in the individual module components as specified below. Unless stated otherwise, successful completion of the module will require successful completion of all individual assessments.</p> <p>Assessment in module component 07-4A4FA-1-102: Introduction to the Fauna of Germany Introduction to the Fauna of Germany</p> <ul style="list-style-type: none"> • 4 ECTS, Method of grading: numerical grade • written examination (approx. 45 minutes) and practical identification assignment (approx. 45 minutes), weighted 1:1 • Assessment offered: once a year, summer semester • Other prerequisites: Admission prerequisite to assessment: regular attendance of exercises and successful completion of the respective exercises (particular emphasis to be placed on the setting up a herbarium) as specified at the beginning of the course. <p>Assessment in module component 07-4A4FA-2-102: Field Excursions on the Fauna of Germany</p> <ul style="list-style-type: none"> • 3 ECTS, Method of grading: (not) successfully completed • log (approx. 1 to 2 pages per field trip) • Assessment offered: once a year, summer semester 		
Allocation of places		
<p>Number of places: 180. Should the number of applications exceed the number of available places, places will be allocated as follows: Places will primarily be allocated to students of the Bachelor's degree subject Biologie (Biology) with 180 ECTS credits. Should the module be used in other subjects, there will be two quotas: 95% of pla-</p>		
Bachelor's with 1 major Mathematics (2012)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Mathematik - 2012	page 53 / 237

ces will be allocated to students of the Bachelor's degree subject Biologie (Biology) with 180 ECTS credits and 5% of places (a minimum of one participant in total) will be allocated to students of the Bachelor's degree subject Biologie (Biology) with 60 ECTS credits and to students of the Bachelor's degree subjects Computational Mathematics and Mathematik (Mathematics), each with 180 ECTS credits, as part of the application-oriented subject Biology (as well as potentially to students of other 'importing' subjects). Should the number of places available in one quota exceed the number of applications, the remaining places will be allocated to applicants from the other quota. Should there be, within one module component, several courses with a restricted number of places, there will be a uniform regulation for the courses of one module component. In this case, places on all courses of a module component that are concerned will be allocated in a standardised procedure. In this procedure, applicants who already have successfully completed at least one other module component of the respective module will be given preferential consideration. A waiting list will be maintained and places re-allocated as they become available. Selection process group 1 (95%): Places will primarily be allocated according to the applicants' previous academic achievements. For this purpose, applicants will be ranked according to the number of ECTS credits they have achieved and their average grade of all assessments taken during their studies or of all module components in the subject of Biologie (Biology) (excluding Chemie (Chemistry), Physik (Physics), Mathematik (Mathematics)) at the time of application. This will be done as follows: First, applicants will be ranked, firstly, according to their average grade weighted according to the number of ECTS credits (qualitative ranking) and, secondly, according to their total number of ECTS credits achieved (quantitative ranking). The applicants' position in a third ranking will be calculated as the sum of these two rankings, and places will be allocated according to this third ranking. Among applicants with the same ranking, places will be allocated according to the qualitative ranking or otherwise by lot. Selection process group 2 (5%): Places will be allocated according to the following quotas: Quota 1 (50% of places): total number of ECTS credits already achieved in modules/module components of the Faculty of Biology; among applicants with the same number of ECTS credits achieved, places will be allocated by lot. Quota 2 (25% of places): number of subject semesters of the respective applicant; among applicants with the same number of subject semesters, places will be allocated by lot. Quota 3 (25% of places): allocation by lot. Should the module be used only in the Bachelor's degree subject Biologie (Biology) with 180 ECTS credits, places will be allocated according to the selection process of group 1.

Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Biology (2011)
Bachelor' degree (1 major) Biology (2010)
Bachelor' degree (1 major) Mathematics (2012)
Bachelor' degree (1 major) Mathematics (2013)
Bachelor' degree (1 major) Computational Mathematics (2012)
Bachelor' degree (1 major) Computational Mathematics (2013)
Bachelor's degree (1 major, 1 minor) Biology (Minor, 2010)

Module title			Abbreviation
Neurobiology 1			07-4S1NVO1-102-m01
Module coordinator		Module offered by	
holder of the Chair of Genetics		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: regular attendance of lab course as specified at the beginning of the course.	
Contents			
Neurobiology and methods in neurobiology, using Drosophila as a neurogenetic model system.			
Intended learning outcomes			
Students have acquired an advanced knowledge of the neurobiology of a model organism and are able to apply the relevant methods in neurobiology.			
Courses (type, number of weekly contact hours, language — if other than German)			
P (no information on SWS (weekly contact hours) and course language available)			
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)			
methods of assessment: a) written examination (approx. 45 to 60 minutes) or b) log (approx. 10 to 20 pages) or c) oral examination of one candidate each (approx. 30 minutes) or d) oral examination in groups of up to 3 candidates (approx. 20 minutes per candidate) or e) presentation (approx. 20 to 30 minutes); students will be informed about the method and length of the assessment prior to the course			
Allocation of places			
Number of places: 20. Should the number of applications exceed the number of available places, places will be allocated as follows: Places will primarily be allocated to students of the Bachelor's degree subject Biologie (Biology) with 180 ECTS credits. Should the module be used in other subjects, there will be two quotas: 95% of places will be allocated to students of the Bachelor's degree subject Biologie (Biology) with 180 ECTS credits and 5% of places (a minimum of one participant in total) will be allocated to students of the Bachelor's degree subject Biologie (Biology) with 60 ECTS credits and to students of the Bachelor's degree subjects Computational Mathematics and Mathematik (Mathematics), each with 180 ECTS credits, as part of the application-oriented subject Biology (as well as potentially to students of other 'importing' subjects). Should the number of places available in one quota exceed the number of applications, the remaining places will be allocated to applicants from the other quota. Should there be, within one module component, several courses with a restricted number of places, there will be a uniform regulation for the courses of one module component. In this case, places on all courses of a module component that are concerned will be allocated in a standardised procedure. In this procedure, applicants who already have successfully completed at least one other module component of the respective module will be given preferential consideration. A waiting list will be maintained and places re-allocated as they become available. Selection process group 1 (95%): Places will primarily be allocated according to the applicants' previous academic achievements. For this purpose, applicants will be ranked according to the number of ECTS credits they have achieved and their average grade of all assessments taken during their studies or of all module components in the subject of Biologie (Biology) (excluding Chemie (Chemistry), Physik (Physics), Mathematik (Mathematics)) at the time of application. This will be done as follows: First, applicants will be ranked, firstly, according to their average grade weighted according to the number of ECTS credits (qualitative ranking) and, secondly, according to their total number of ECTS credits achieved (quantitative ranking). The applicants' position in a third ranking will be calculated as the sum of these two rankings, and places will be allocated according to this third ranking. Among applicants with the same ranking, places will be allocated according to the qualitative ranking or otherwise by lot. Selection process group 2 (5%): Places will be allocated according to the following quotas: Quota 1 (50% of places): total number of ECTS credits already achieved in modules/module components of the Faculty of Biology; among applicants with the same number of ECTS credits achieved, places will be allocated by lot. Quota 2 (25% of places): number of subject semesters of the respective applicant;			
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among applicants with the same number of subject semesters, places will be allocated by lot. Quota 3 (25% of places): allocation by lot. Should the module be used only in the Bachelor's degree subject Biologie (Biology) with 180 ECTS credits, places will be allocated according to the selection process of group 1.

Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Biology (2010)
Bachelor' degree (1 major) Mathematics (2012)
Bachelor' degree (1 major) Mathematics (2013)
Bachelor' degree (1 major) Computational Mathematics (2012)
Bachelor' degree (1 major) Computational Mathematics (2013)
Bachelor's degree (1 major, 1 minor) Biology (Minor, 2010)

Module title			Abbreviation
Integrative Behavioral Biology			07-4S1NVO2-102-m01
Module coordinator		Module offered by	
holder of the Chair of Behavioral Physiology and Sociobiology		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: regular attendance of exercises and successful completion of the respective exercises as specified at the beginning of the course.	
Contents			
Communication in the animal kingdom, neuroethology and behavioural development, perception and processing of olfactory signals, temporal organisation of behaviour, adaptive feeding behaviour, reproductive behaviour, social behaviour, orientation mechanisms.			
Intended learning outcomes			
Students have acquired an advanced knowledge in the area of behavioural biology and are able to deliver presentations on current studies on relevant topics.			
Courses (type, number of weekly contact hours, language — if other than German)			
V + S (no information on SWS (weekly contact hours) and course language available)			
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)			
methods of assessment: a) written examination (approx. 45 to 60 minutes) or b) log (approx. 10 to 20 pages) or c) oral examination of one candidate each (approx. 30 minutes) or d) oral examination in groups of up to 3 candidates (approx. 20 minutes per candidate) or e) presentation (approx. 20 to 30 minutes); students will be informed about the method and length of the assessment prior to the course			
Allocation of places			
Number of places: 20. Should the number of applications exceed the number of available places, places will be allocated as follows: Places will primarily be allocated to students of the Bachelor's degree subject Biologie (Biology) with 180 ECTS credits. Should the module be used in other subjects, there will be two quotas: 95% of places will be allocated to students of the Bachelor's degree subject Biologie (Biology) with 180 ECTS credits and 5% of places (a minimum of one participant in total) will be allocated to students of the Bachelor's degree subject Biologie (Biology) with 60 ECTS credits and to students of the Bachelor's degree subjects Computational Mathematics and Mathematik (Mathematics), each with 180 ECTS credits, as part of the application-oriented subject Biology (as well as potentially to students of other 'importing' subjects). Should the number of places available in one quota exceed the number of applications, the remaining places will be allocated to applicants from the other quota. Should there be, within one module component, several courses with a restricted number of places, there will be a uniform regulation for the courses of one module component. In this case, places on all courses of a module component that are concerned will be allocated in a standardised procedure. In this procedure, applicants who already have successfully completed at least one other module component of the respective module will be given preferential consideration. A waiting list will be maintained and places re-allocated as they become available. Selection process group 1 (95%): Places will primarily be allocated according to the applicants' previous academic achievements. For this purpose, applicants will be ranked according to the number of ECTS credits they have achieved and their average grade of all assessments taken during their studies or of all module components in the subject of Biologie (Biology) (excluding Chemie (Chemistry), Physik (Physics), Mathematik (Mathematics)) at the time of application. This will be done as follows: First, applicants will be ranked, firstly, according to their average grade weighted according to the number of ECTS credits (qualitative ranking) and, secondly, according to their total number of ECTS credits achieved (quantitative ranking). The applicants' position in a third ranking will be calculated as the sum of these two rankings, and places will be allocated according to this third ranking. Among applicants with the same ranking, places will be allocated according to the			
Bachelor's with 1 major Mathematics (2012)		JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Mathematik - 2012	
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qualitative ranking or otherwise by lot. Selection process group 2 (5%): Places will be allocated according to the following quotas: Quota 1 (50% of places): total number of ECTS credits already achieved in modules/module components of the Faculty of Biology; among applicants with the same number of ECTS credits achieved, places will be allocated by lot. Quota 2 (25% of places): number of subject semesters of the respective applicant; among applicants with the same number of subject semesters, places will be allocated by lot. Quota 3 (25% of places): allocation by lot. Should the module be used only in the Bachelor's degree subject Biologie (Biology) with 180 ECTS credits, places will be allocated according to the selection process of group 1.

Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Biology (2011)
Bachelor' degree (1 major) Biology (2010)
Bachelor' degree (1 major) Mathematics (2012)
Bachelor' degree (1 major) Mathematics (2013)
Bachelor' degree (1 major) Computational Mathematics (2012)
Bachelor' degree (1 major) Computational Mathematics (2013)
Bachelor's degree (1 major, 1 minor) Biology (Minor, 2010)

Module title		Abbreviation
Basics in Light- and Electron-Microscopy		07-4S1MZ1-102-m01
Module coordinator		Module offered by
head of 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: regular attendance of exercises and successful completion of the respective exercises as specified at the beginning of the course.
Contents		
Fundamental principles of confocal laser scanning microscopy and electron microscopy.		
Intended learning outcomes		
Students have acquired theoretical knowledge and practical skills in the area of light and electron microscopy.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 30 to 60 minutes)		
Allocation of places		
<p>Number of places: 18. Should the number of applications exceed the number of available places, places will be allocated as follows: Places will primarily be allocated to students of the Bachelor's degree subject Biologie (Biology) with 180 ECTS credits. Should the module be used in other subjects, there will be two quotas: 95% of places will be allocated to students of the Bachelor's degree subject Biologie (Biology) with 180 ECTS credits and 5% of places (a minimum of one participant in total) will be allocated to students of the Bachelor's degree subject Biologie (Biology) with 60 ECTS credits and to students of the Bachelor's degree subjects Computational Mathematics and Mathematik (Mathematics), each with 180 ECTS credits, as part of the application-oriented subject Biology (as well as potentially to students of other 'importing' subjects). Should the number of places available in one quota exceed the number of applications, the remaining places will be allocated to applicants from the other quota. Should there be, within one module component, several courses with a restricted number of places, there will be a uniform regulation for the courses of one module component. In this case, places on all courses of a module component that are concerned will be allocated in a standardised procedure. In this procedure, applicants who already have successfully completed at least one other module component of the respective module will be given preferential consideration. A waiting list will be maintained and places re-allocated as they become available. Selection process group 1 (95%): Places will primarily be allocated according to the applicants' previous academic achievements. For this purpose, applicants will be ranked according to the number of ECTS credits they have achieved and their average grade of all assessments taken during their studies or of all module components in the subject of Biologie (Biology) (excluding Chemie (Chemistry), Physik (Physics), Mathematik (Mathematics)) at the time of application. This will be done as follows: First, applicants will be ranked, firstly, according to their average grade weighted according to the number of ECTS credits (qualitative ranking) and, secondly, according to their total number of ECTS credits achieved (quantitative ranking). The applicants' position in a third ranking will be calculated as the sum of these two rankings, and places will be allocated according to this third ranking. Among applicants with the same ranking, places will be allocated according to the qualitative ranking or otherwise by lot. Selection process group 2 (5%): Places will be allocated according to the following quotas: Quota 1 (50% of places): total number of ECTS credits already achieved in modules/module components of the Faculty of Biology; among applicants with the same number of ECTS credits achieved, places will be allocated by lot. Quota 2 (25% of places): number of subject semesters of the respective applicant; among applicants with the same number of subject semesters, places will be allocated by lot. Quota 3 (25% of places): allocation by lot. Should the module be used only in the Bachelor's degree subject Biologie (Biology) with 180 ECTS credits, places will be allocated according to the selection process of group 1.</p>		
Bachelor's with 1 major Mathematics (2012)		page 59 / 237
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Additional information
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Workload
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Teaching cycle
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Referred to in LPO I (examination regulations for teaching-degree programmes)
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Module appears in
Bachelor' degree (1 major) Biology (2011) Bachelor' degree (1 major) Biology (2010) Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Physics (2010) Bachelor' degree (1 major) Nanostructure Technology (2010) Bachelor' degree (1 major) Nanostructure Technology (2012) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) Bachelor's degree (1 major, 1 minor) Biology (Minor, 2010)

Module title			Abbreviation
Analysis of Chromosomes			07-4S1MZ2-102-m01
Module coordinator		Module offered by	
head of 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: regular attendance of exercises and successful completion of the respective exercises as specified at the beginning of the course.	
Contents			
Overview of the structure of chromosomes of somatic and meiotic cells.			
Intended learning outcomes			
Students are able to analyse chromosomal structures.			
Courses (type, number of weekly contact hours, language — if other than German)			
V + Ü (no information on SWS (weekly contact hours) and course language available)			
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)			
written examination (approx. 30 to 60 minutes)			
Allocation of places			
Number of places: 18. Should the number of applications exceed the number of available places, places will be allocated as follows: Places will primarily be allocated to students of the Bachelor's degree subject Biologie (Biology) with 180 ECTS credits. Should the module be used in other subjects, there will be two quotas: 95% of places will be allocated to students of the Bachelor's degree subject Biologie (Biology) with 180 ECTS credits and 5% of places (a minimum of one participant in total) will be allocated to students of the Bachelor's degree subject Biologie (Biology) with 60 ECTS credits and to students of the Bachelor's degree subjects Computational Mathematics and Mathematik (Mathematics), each with 180 ECTS credits, as part of the application-oriented subject Biology (as well as potentially to students of other 'importing' subjects). Should the number of places available in one quota exceed the number of applications, the remaining places will be allocated to applicants from the other quota. Should there be, within one module component, several courses with a restricted number of places, there will be a uniform regulation for the courses of one module component. In this case, places on all courses of a module component that are concerned will be allocated in a standardised procedure. In this procedure, applicants who already have successfully completed at least one other module component of the respective module will be given preferential consideration. A waiting list will be maintained and places re-allocated as they become available. Selection process group 1 (95%): Places will primarily be allocated according to the applicants' previous academic achievements. For this purpose, applicants will be ranked according to the number of ECTS credits they have achieved and their average grade of all assessments taken during their studies or of all module components in the subject of Biologie (Biology) (excluding Chemie (Chemistry), Physik (Physics), Mathematik (Mathematics)) at the time of application. This will be done as follows: First, applicants will be ranked, firstly, according to their average grade weighted according to the number of ECTS credits (qualitative ranking) and, secondly, according to their total number of ECTS credits achieved (quantitative ranking). The applicants' position in a third ranking will be calculated as the sum of these two rankings, and places will be allocated according to this third ranking. Among applicants with the same ranking, places will be allocated according to the qualitative ranking or otherwise by lot. Selection process group 2 (5%): Places will be allocated according to the following quotas: Quota 1 (50% of places): total number of ECTS credits already achieved in modules/module components of the Faculty of Biology; among applicants with the same number of ECTS credits achieved, places will be allocated by lot. Quota 2 (25% of places): number of subject semesters of the respective applicant; among applicants with the same number of subject semesters, places will be allocated by lot. Quota 3 (25% of places): allocation by lot. Should the module be used only in the Bachelor's degree subject Biologie (Biology) with 180 ECTS credits, places will be allocated according to the selection process of group 1.			
Bachelor's with 1 major Mathematics (2012)		JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Mathematik - 2012	
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Additional information
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Workload
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Teaching cycle
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Referred to in LPO I (examination regulations for teaching-degree programmes)
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Module appears in
Bachelor' degree (1 major) Biology (2011) Bachelor' degree (1 major) Biology (2010) Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) Bachelor's degree (1 major, 1 minor) Biology (Minor, 2010)

Module title		Abbreviation
Special Bioinformatics 1		07-4S1MZ6-102-m01
Module coordinator		Module offered by
holder of the Chair of Bioinformatics		Faculty of Biology
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: regular attendance of exercises and successful completion of the respective exercises as specified at the beginning of the course.
Contents		
Fundamental principles of the tree of life, fundamental principles of phylogenetics (methods and markers), fundamental principles of evolutionary biology (concepts), sequence analysis, RNA structure prediction, phylogenetic reconstruction.		
Intended learning outcomes		
Students are able to use software and databases for sequence analysis, RNA structure prediction and phylogenetic reconstruction.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
log (approx. 10 to 20 pages) Language of assessment: German or English		
Allocation of places		
<p>Number of places: 20. Should the number of applications exceed the number of available places, places will be allocated as follows: Places will primarily be allocated to students of the Bachelor's degree subject Biologie (Biology) with 180 ECTS credits. Should the module be used in other subjects, there will be two quotas: 95% of places will be allocated to students of the Bachelor's degree subject Biologie (Biology) with 180 ECTS credits and 5% of places (a minimum of one participant in total) will be allocated to students of the Bachelor's degree subject Biologie (Biology) with 60 ECTS credits and to students of the Bachelor's degree subjects Computational Mathematics and Mathematik (Mathematics), each with 180 ECTS credits, as part of the application-oriented subject Biology (as well as potentially to students of other 'importing' subjects). Should the number of places available in one quota exceed the number of applications, the remaining places will be allocated to applicants from the other quota. Should there be, within one module component, several courses with a restricted number of places, there will be a uniform regulation for the courses of one module component. In this case, places on all courses of a module component that are concerned will be allocated in a standardised procedure. In this procedure, applicants who already have successfully completed at least one other module component of the respective module will be given preferential consideration. A waiting list will be maintained and places re-allocated as they become available. Selection process group 1 (95%): Places will primarily be allocated according to the applicants' previous academic achievements. For this purpose, applicants will be ranked according to the number of ECTS credits they have achieved and their average grade of all assessments taken during their studies or of all module components in the subject of Biologie (Biology) (excluding Chemie (Chemistry), Physik (Physics), Mathematik (Mathematics)) at the time of application. This will be done as follows: First, applicants will be ranked, firstly, according to their average grade weighted according to the number of ECTS credits (qualitative ranking) and, secondly, according to their total number of ECTS credits achieved (quantitative ranking). The applicants' position in a third ranking will be calculated as the sum of these two rankings, and places will be allocated according to this third ranking. Among applicants with the same ranking, places will be allocated according to the qualitative ranking or otherwise by lot. Selection process group 2 (5%): Places will be allocated according to the following quotas: Quota 1 (50% of places): total number of ECTS credits already achieved in modules/module components of the Faculty of Biology; among applicants with the same number of ECTS credits achieved, pla-</p>		
Bachelor's with 1 major Mathematics (2012)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Mathematik - 2012	page 63 / 237

ces will be allocated by lot. Quota 2 (25% of places): number of subject semesters of the respective applicant; among applicants with the same number of subject semesters, places will be allocated by lot. Quota 3 (25% of places): allocation by lot. Should the module be used only in the Bachelor's degree subject Biologie (Biology) with 180 ECTS credits, places will be allocated according to the selection process of group 1.

Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Biology (2011)
Bachelor' degree (1 major) Biology (2010)
Bachelor' degree (1 major) Mathematics (2012)
Bachelor' degree (1 major) Mathematics (2013)
Bachelor' degree (1 major) Physics (2010)
Bachelor' degree (1 major) Nanostructure Technology (2010)
Bachelor' degree (1 major) Nanostructure Technology (2012)
Bachelor' degree (1 major) Computational Mathematics (2012)
Bachelor' degree (1 major) Computational Mathematics (2013)
Bachelor's degree (1 major, 1 minor) Biology (Minor, 2010)

Module title		Abbreviation
Molecular modelling - From DNA to protein		07-4S1PS1-102-m01
Module coordinator		Module offered by
holder of the Chair of Plant Physiology and Biophysics		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: regular attendance of exercises and successful completion of the respective exercises as specified at the beginning of the course.
Contents		
This module will equip students with advanced knowledge on the structure and function of nucleic acids and proteins as well as on the search for and analysis and modelling of plant macromolecules using databases and specific software.		
Intended learning outcomes		
Students have acquired a specialist knowledge of the structure-function relationships of macromolecules and are able to work with relevant databases and software.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
computerised practical examination (approx. 6 hours)		
Allocation of places		
<p>Number of places: 18. Should the number of applications exceed the number of available places, places will be allocated as follows: Places will primarily be allocated to students of the Bachelor's degree subject Biologie (Biology) with 180 ECTS credits. Should the module be used in other subjects, there will be two quotas: 95% of places will be allocated to students of the Bachelor's degree subject Biologie (Biology) with 180 ECTS credits and 5% of places (a minimum of one participant in total) will be allocated to students of the Bachelor's degree subject Biologie (Biology) with 60 ECTS credits and to students of the Bachelor's degree subjects Computational Mathematics and Mathematik (Mathematics), each with 180 ECTS credits, as part of the application-oriented subject Biology (as well as potentially to students of other 'importing' subjects). Should the number of places available in one quota exceed the number of applications, the remaining places will be allocated to applicants from the other quota. Should there be, within one module component, several courses with a restricted number of places, there will be a uniform regulation for the courses of one module component. In this case, places on all courses of a module component that are concerned will be allocated in a standardised procedure. In this procedure, applicants who already have successfully completed at least one other module component of the respective module will be given preferential consideration. A waiting list will be maintained and places re-allocated as they become available. Selection process group 1 (95%): Places will primarily be allocated according to the applicants' previous academic achievements. For this purpose, applicants will be ranked according to the number of ECTS credits they have achieved and their average grade of all assessments taken during their studies or of all module components in the subject of Biologie (Biology) (excluding Chemie (Chemistry), Physik (Physics), Mathematik (Mathematics)) at the time of application. This will be done as follows: First, applicants will be ranked, firstly, according to their average grade weighted according to the number of ECTS credits (qualitative ranking) and, secondly, according to their total number of ECTS credits achieved (quantitative ranking). The applicants' position in a third ranking will be calculated as the sum of these two rankings, and places will be allocated according to this third ranking. Among applicants with the same ranking, places will be allocated according to the qualitative ranking or otherwise by lot. Selection process group 2 (5%): Places will be allocated according to the following quotas: Quota 1 (50% of places): total number of ECTS credits already achieved in modules/module components of the Faculty of Biology; among applicants with the same number of ECTS credits achieved, places will be allocated by lot. Quota 2 (25% of places): number of subject semesters of the respective applicant;</p>		
Bachelor's with 1 major Mathematics (2012)		page 65 / 237

among applicants with the same number of subject semesters, places will be allocated by lot. Quota 3 (25% of places): allocation by lot. Should the module be used only in the Bachelor's degree subject Biologie (Biology) with 180 ECTS credits, places will be allocated according to the selection process of group 1.

Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Biology (2011)
Bachelor' degree (1 major) Biology (2010)
Bachelor' degree (1 major) Mathematics (2012)
Bachelor' degree (1 major) Mathematics (2013)
Bachelor' degree (1 major) Computational Mathematics (2012)
Bachelor' degree (1 major) Computational Mathematics (2013)
Bachelor's degree (1 major, 1 minor) Biology (Minor, 2010)

Module title			Abbreviation
Introduction to Methods in Plant Ecophysiology			07-4S1PS2-102-m01
Module coordinator		Module offered by	
holder of the Chair of Plant Physiology and Biophysics		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: regular attendance of exercises and seminar as well as successful completion of the respective exercises as specified at the beginning of the course.	
Contents			
Complex experiments to introduce students to the current state of research in plant ecophysiology as well as discussion of experimental findings in a comprehensive scientific context.			
Intended learning outcomes			
Students are able to use current methods in plant ecophysiology as well as to document experimental findings and put these in a scientific context.			
Courses (type, number of weekly contact hours, language — if other than German)			
Ü + S (no information on SWS (weekly contact hours) and course language available)			
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)			
log (approx. 10 to 20 pages)			
Allocation of places			
Number of places: 15. Should the number of applications exceed the number of available places, places will be allocated as follows: Places will primarily be allocated to students of the Bachelor's degree subject Biologie (Biology) with 180 ECTS credits. Should the module be used in other subjects, there will be two quotas: 95% of places will be allocated to students of the Bachelor's degree subject Biologie (Biology) with 180 ECTS credits and 5% of places (a minimum of one participant in total) will be allocated to students of the Bachelor's degree subject Biologie (Biology) with 60 ECTS credits and to students of the Bachelor's degree subjects Computational Mathematics and Mathematik (Mathematics), each with 180 ECTS credits, as part of the application-oriented subject Biology (as well as potentially to students of other 'importing' subjects). Should the number of places available in one quota exceed the number of applications, the remaining places will be allocated to applicants from the other quota. Should there be, within one module component, several courses with a restricted number of places, there will be a uniform regulation for the courses of one module component. In this case, places on all courses of a module component that are concerned will be allocated in a standardised procedure. In this procedure, applicants who already have successfully completed at least one other module component of the respective module will be given preferential consideration. A waiting list will be maintained and places re-allocated as they become available. Selection process group 1 (95%): Places will primarily be allocated according to the applicants' previous academic achievements. For this purpose, applicants will be ranked according to the number of ECTS credits they have achieved and their average grade of all assessments taken during their studies or of all module components in the subject of Biologie (Biology) (excluding Chemie (Chemistry), Physik (Physics), Mathematik (Mathematics)) at the time of application. This will be done as follows: First, applicants will be ranked, firstly, according to their average grade weighted according to the number of ECTS credits (qualitative ranking) and, secondly, according to their total number of ECTS credits achieved (quantitative ranking). The applicants' position in a third ranking will be calculated as the sum of these two rankings, and places will be allocated according to this third ranking. Among applicants with the same ranking, places will be allocated according to the qualitative ranking or otherwise by lot. Selection process group 2 (5%): Places will be allocated according to the following quotas: Quota 1 (50% of places): total number of ECTS credits already achieved in modules/module components of the Faculty of Biology; among applicants with the same number of ECTS credits achieved, places will be allocated by lot. Quota 2 (25% of places): number of subject semesters of the respective applicant; among applicants with the same number of subject semesters, places will be allocated by lot. Quota 3 (25% of			
Bachelor's with 1 major Mathematics (2012)		JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Mathematik - 2012	
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places): allocation by lot. Should the module be used only in the Bachelor's degree subject Biologie (Biology) with 180 ECTS credits, places will be allocated according to the selection process of group 1.

Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Biology (2010)
Bachelor' degree (1 major) Mathematics (2012)
Bachelor' degree (1 major) Mathematics (2013)
Bachelor' degree (1 major) Computational Mathematics (2012)
Bachelor' degree (1 major) Computational Mathematics (2013)
Bachelor's degree (1 major, 1 minor) Biology (Minor, 2010)

Module title		Abbreviation
Pharmaceutical Drugs in Plants		07-4S1PS3-102-m01
Module coordinator		Module offered by
holder of the Chair of Pharmaceutical 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: regular attendance of exercises and seminar as well as successful completion of the respective exercises as specified at the beginning of the course.
Contents		
This module will introduce students to the major active agent groups in medicinal plants and phytopharmaceuticals as well as to their application in pharmacy. Microscopic and phytochemical analyses will be performed and the requirements and analytical methods of the pharmacopoeia will be explained.		
Intended learning outcomes		
Students have acquired a specialist knowledge on active agents from medicinal plants and phytopharmaceuticals as well as on the requirements and analytical methods of the pharmacopoeia.		
Courses (type, number of weekly contact hours, language — if other than German)		
Ü + S (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
methods of assessment: a) written examination (approx. 45 to 60 minutes) or b) log (approx. 10 to 20 pages) or c) oral examination of one candidate each (approx. 30 minutes) or d) oral examination in groups of up to 3 candidates (approx. 20 minutes per candidate) or e) presentation (approx. 20 to 30 minutes); students will be informed about the method and length of the assessment prior to the course		
Allocation of places		
Number of places: 6. Should the number of applications exceed the number of available places, places will be allocated as follows: Places will primarily be allocated to students of the Bachelor's degree subject Biologie (Biology) with 180 ECTS credits. Should the module be used in other subjects, there will be two quotas: 95% of places will be allocated to students of the Bachelor's degree subject Biologie (Biology) with 180 ECTS credits and 5% of places (a minimum of one participant in total) will be allocated to students of the Bachelor's degree subject Biologie (Biology) with 60 ECTS credits and to students of the Bachelor's degree subjects Computational Mathematics and Mathematik (Mathematics), each with 180 ECTS credits, as part of the application-oriented subject Biology (as well as potentially to students of other 'importing' subjects). Should the number of places available in one quota exceed the number of applications, the remaining places will be allocated to applicants from the other quota. Should there be, within one module component, several courses with a restricted number of places, there will be a uniform regulation for the courses of one module component. In this case, places on all courses of a module component that are concerned will be allocated in a standardised procedure. In this procedure, applicants who already have successfully completed at least one other module component of the respective module will be given preferential consideration. A waiting list will be maintained and places re-allocated as they become available. Selection process group 1 (95%): Places will primarily be allocated according to the applicants' previous academic achievements. For this purpose, applicants will be ranked according to the number of ECTS credits they have achieved and their average grade of all assessments taken during their studies or of all module components in the subject of Biologie (Biology) (excluding Chemie (Chemistry), Physik (Physics), Mathematik (Mathematics)) at the time of application. This will be done as follows: First, applicants will be ranked, firstly, according to their average grade weighted according to the number of ECTS credits (qualitative ranking) and, secondly, according to their total number of ECTS credits achieved (quantitative ranking). The applicants' position in a third ranking will be calculated as the sum of these two rankings, and places will be allocated according to this third ranking. Among applicants with the same ranking, places will be allocated according to the qualitative ranking or otherwise by lot. Selection process group 2 (5%): Places will be allocated according to the		
Bachelor's with 1 major Mathematics (2012)		page 69 / 237

following quotas: Quota 1 (50% of places): total number of ECTS credits already achieved in modules/module components of the Faculty of Biology; among applicants with the same number of ECTS credits achieved, places will be allocated by lot. Quota 2 (25% of places): number of subject semesters of the respective applicant; among applicants with the same number of subject semesters, places will be allocated by lot. Quota 3 (25% of places): allocation by lot. Should the module be used only in the Bachelor's degree subject Biologie (Biology) with 180 ECTS credits, places will be allocated according to the selection process of group 1.

Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Biology (2011)
Bachelor' degree (1 major) Biology (2010)
Bachelor' degree (1 major) Mathematics (2012)
Bachelor' degree (1 major) Mathematics (2013)
Bachelor' degree (1 major) Computational Mathematics (2012)
Bachelor' degree (1 major) Computational Mathematics (2013)
Bachelor's degree (1 major, 1 minor) Biology (Minor, 2010)

Module title		Abbreviation
Laboratory practical course I		07-S1-LP1-102-m01
Module coordinator		Module offered by
Coordinator BioCareers		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: regular attendance of lab course as specified at the beginning of the course; please consult with academic advisory service in advance.
Contents		
This practical course is offered by an institution that is part of the University. Contents to be determined by the respective institution.		
Intended learning outcomes		
Students have developed skills which qualify them to work in their profession.		
Courses (type, number of weekly contact hours, language — if other than German)		
P (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
methods of assessment: a) written examination (approx. 45 to 60 minutes) or b) log (approx. 10 to 20 pages) or c) oral examination of one candidate each (approx. 30 minutes) or d) oral examination in groups of up to 3 candidates (approx. 20 minutes per candidate) or e) presentation (approx. 20 to 30 minutes); students will be informed about the method and length of the assessment prior to the course		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Biology (2011) Bachelor' degree (1 major) Biology (2010) Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) Bachelor's degree (1 major, 1 minor) Biology (Minor, 2010)		

Module title		Abbreviation
Excursion I		07-S1-Ex1-102-m01
Module coordinator		Module offered by
Coordinator BioCareers		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: regular attendance of field trip as specified at the beginning of the course; please consult with academic advisory service in advance.
Contents		
Contents of the field trip to be determined by the respective institution.		
Intended learning outcomes		
Students have developed skills which qualify them to work in their profession.		
Courses (type, number of weekly contact hours, language — if other than German)		
E (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
methods of assessment: a) written examination (approx. 45 to 60 minutes) or b) log (approx. 10 to 20 pages) or c) oral examination of one candidate each (approx. 30 minutes) or d) oral examination in groups of up to 3 candidates (approx. 20 minutes per candidate) or e) presentation (approx. 20 to 30 minutes); students will be informed about the method and length of the assessment prior to the course		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Biology (2011) Bachelor' degree (1 major) Biology (2010) Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) Bachelor's degree (1 major, 1 minor) Biology (Minor, 2010)		

Module title		Abbreviation
Interdisciplinary Project I		07-S1-IP1-102-m01
Module coordinator		Module offered by
Coordinator BioCareers		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: regular attendance of project sessions as specified at the beginning of the course; please consult with academic advisory service in advance.
Contents		
Contents of the project to be determined by the competent coordinators; contents will vary according to topic.		
Intended learning outcomes		
Students have developed skills which qualify them to work in their profession.		
Courses (type, number of weekly contact hours, language — if other than German)		
R (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
methods of assessment: a) written examination (approx. 45 to 60 minutes) or b) log (approx. 10 to 20 pages) or c) oral examination of one candidate each (approx. 30 minutes) or d) oral examination in groups of up to 3 candidates (approx. 20 minutes per candidate) or e) presentation (approx. 20 to 30 minutes); students will be informed about the method and length of the assessment prior to the course		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Biology (2011) Bachelor' degree (1 major) Biology (2010) Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) Bachelor's degree (1 major, 1 minor) Biology (Minor, 2010)		

Module title		Abbreviation
External Practical Course		07-5EP-102-m01
Module coordinator		Module offered by
Coordinator BioCareers		Faculty of Biology
ECTS	Method of grading	Only after succ. compl. of module(s)
10	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: regular attendance of lab course as specified at the beginning of the course; please consult with academic advisory service in advance.
Contents		
Students will complete a placement at an authority, a non-university research institution or a business. Contents to be determined by the respective institution.		
Intended learning outcomes		
Students are familiar with the structures of external institutions and businesses and have developed skills which qualify them to work in their profession.		
Courses (type, number of weekly contact hours, language — if other than German)		
P (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
methods of assessment: a) written examination (approx. 45 to 60 minutes) or b) log (approx. 10 to 20 pages) or c) oral examination of one candidate each (approx. 30 minutes) or d) oral examination in groups of up to 3 candidates (approx. 20 minutes per candidate) or e) presentation (approx. 20 to 30 minutes); students will be informed about the method and length of the assessment prior to the course		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Biology (2011) Bachelor' degree (1 major) Biology (2010) Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) Bachelor's degree (1 major, 1 minor) Biology (Minor, 2010)		

Module title		Abbreviation
Excursion II		07-S2-EX2-102-m01
Module coordinator		Module offered by
Coordinator BioCareers		Faculty of Biology
ECTS	Method of grading	Only after succ. compl. of module(s)
10	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: regular attendance of field trip as specified at the beginning of the course; please consult with academic advisory service in advance.
Contents		
[Version 1: Contents of the field trip to be determined by the respective institution.] [Version 2: Contents of the project to be determined by the competent coordinators; contents will vary according to topic.]		
Intended learning outcomes		
Students have developed skills which qualify them to work in their profession.		
Courses (type, number of weekly contact hours, language — if other than German)		
E (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
methods of assessment: a) written examination (approx. 45 to 60 minutes) or b) log (approx. 10 to 20 pages) or c) oral examination of one candidate each (approx. 30 minutes) or d) oral examination in groups of up to 3 candidates (approx. 20 minutes per candidate) or e) presentation (approx. 20 to 30 minutes); students will be informed about the method and length of the assessment prior to the course		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Biology (2011) Bachelor' degree (1 major) Biology (2010) Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) Bachelor's degree (1 major, 1 minor) Biology (Minor, 2010)		

Module title		Abbreviation
Interdisciplinary Project II		07-S2-IP2-102-m01
Module coordinator		Module offered by
Coordinator BioCareers		Faculty of Biology
ECTS	Method of grading	Only after succ. compl. of module(s)
10	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: regular attendance of project sessions as specified at the beginning of the course; please consult with academic advisory service in advance.
Contents		
Contents of the project to be determined by the competent coordinators; contents will vary according to topic.		
Intended learning outcomes		
Students have developed skills which qualify them to work in their profession.		
Courses (type, number of weekly contact hours, language — if other than German)		
R (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
methods of assessment: a) written examination (approx. 45 to 60 minutes) or b) log (approx. 10 to 20 pages) or c) oral examination of one candidate each (approx. 30 minutes) or d) oral examination in groups of up to 3 candidates (approx. 20 minutes per candidate) or e) presentation (approx. 20 to 30 minutes); students will be informed about the method and length of the assessment prior to the course		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Biology (2011) Bachelor' degree (1 major) Biology (2010) Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) Bachelor's degree (1 major, 1 minor) Biology (Minor, 2010)		

Module title		Abbreviation
Laboratory Practical Course II		07-S2-LP2-102-m01
Module coordinator		Module offered by
Coordinator BioCareers		Faculty of Biology
ECTS	Method of grading	Only after succ. compl. of module(s)
10	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: regular attendance of lab course as specified at the beginning of the course; please consult with academic advisory service in advance.
Contents		
This practical course is offered by an institution that is part of the University. Contents to be determined by the respective institution.		
Intended learning outcomes		
Students are familiar with the structures of internal institutions and have developed skills which qualify them to work in their profession.		
Courses (type, number of weekly contact hours, language — if other than German)		
P (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
methods of assessment: a) written examination (approx. 45 to 60 minutes) or b) log (approx. 10 to 20 pages) or c) oral examination of one candidate each (approx. 30 minutes) or d) oral examination in groups of up to 3 candidates (approx. 20 minutes per candidate) or e) presentation (approx. 20 to 30 minutes); students will be informed about the method and length of the assessment prior to the course		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Biology (2011) Bachelor' degree (1 major) Biology (2010) Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) Bachelor's degree (1 major, 1 minor) Biology (Minor, 2010)		

Module title			Abbreviation
Organisation and Safety in Biosciences			07-SQF-OSB-102-m01
Module coordinator		Module offered by	
Coordinator BioCareers		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	--	
Contents			
Safety procedures in the biosciences, in particular radiation protection, handling of genetically modified organisms, hygiene procedures and hazardous substances, working with lab animals. Fundamental concepts that help ensure an effective and efficient workflow in the biosciences. Structure and organisation of institutions in the bioscience/biotech sector. Process-based project management. HR management in the biosciences, responsibilities of managers/supervisors, appraisal interviews, target agreements, management styles.			
Intended learning outcomes			
Students have developed a fundamental knowledge of the regulations governing work in the bioscience sector and are familiar with fundamental organisational principles that are relevant for work in research and production. They are also familiar with fundamental principles of process-based project work in the biosciences.			
Courses (type, number of weekly contact hours, language — if other than German)			
V + S (no information on SWS (weekly contact hours) and course language available)			
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)			
a) written examination (30 to 60 minutes) and b) presentation (approx. 10 minutes) or term paper (approx. 5 to 10 pages)			
Allocation of places			
Number of places: 15. Should the number of applications exceed the number of available places, places will be allocated as follows: Places will primarily be allocated to students of the Bachelor's degree subject Biologie (Biology) with 180 ECTS credits. Should the module be used in other subjects, there will be two quotas: 95% of places will be allocated to students of the Bachelor's degree subject Biologie (Biology) with 180 ECTS credits and 5% of places (a minimum of one participant in total) will be allocated to students of the Bachelor's degree subject Biologie (Biology) with 60 ECTS credits and to students of the Bachelor's degree subjects Computational Mathematics and Mathematik (Mathematics), each with 180 ECTS credits, as part of the application-oriented subject Biology (as well as potentially to students of other 'importing' subjects). Should the number of places available in one quota exceed the number of applications, the remaining places will be allocated to applicants from the other quota. Should there be, within one module component, several courses with a restricted number of places, there will be a uniform regulation for the courses of one module component. In this case, places on all courses of a module component that are concerned will be allocated in a standardised procedure. In this procedure, applicants who already have successfully completed at least one other module component of the respective module will be given preferential consideration. A waiting list will be maintained and places re-allocated as they become available. Selection process group 1 (95%): Places will primarily be allocated according to the applicants' previous academic achievements. For this purpose, applicants will be ranked according to the number of ECTS credits they have achieved and their average grade of all assessments taken during their studies or of all module components in the subject of Biologie (Biology) (excluding Chemie (Chemistry), Physik (Physics), Mathematik (Mathematics)) at the time of application. This will be done as follows: First, applicants will be ranked, firstly, according to their average grade weighted according to the number of ECTS credits (qualitative ranking) and, secondly, according to their total number of ECTS credits achieved (quantitative ranking). The applicants' position in a third ranking will be calculated as the sum of these two rankings, and places will be allocated according to this third ranking. Among applicants with the same ranking, places will be allocated according to the qualitative ranking or otherwise by lot. Selection process group 2 (5%): Places will be allocated according to the following quotas: Quota 1 (50% of places): total number of ECTS credits already achieved in modules/module			
Bachelor's with 1 major Mathematics (2012)		JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Mathematik - 2012	
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components of the Faculty of Biology; among applicants with the same number of ECTS credits achieved, places will be allocated by lot. Quota 2 (25% of places): number of subject semesters of the respective applicant; among applicants with the same number of subject semesters, places will be allocated by lot. Quota 3 (25% of places): allocation by lot. Should the module be used only in the Bachelor's degree subject Biologie (Biology) with 180 ECTS credits, places will be allocated according to the selection process of group 1.

Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Biology (2011)
Bachelor' degree (1 major) Biology (2010)
Bachelor' degree (1 major) Mathematics (2012)
Bachelor' degree (1 major) Mathematics (2013)
Bachelor' degree (1 major) Computational Mathematics (2012)
Bachelor' degree (1 major) Computational Mathematics (2013)
Bachelor's degree (1 major, 1 minor) Biology (Minor, 2010)

Module title		Abbreviation
Developmental Biology of Plants for minor field of study		07-3A3EBIOP-102-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)
4	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: regular attendance of exercises and successful completion of the respective exercises as specified at the beginning of the course.
Contents		
In this module, students will acquire an insight into the fundamental processes of plant developmental biology over a plant's entire life cycle from germination to reproduction. The module will discuss the molecular determination and regulation of different developmental biological processes in plants as well as their plasticity.		
Intended learning outcomes		
1. Fundamental concepts in developmental biology. 2. Developmental biology of selected model organisms. 3. Selected molecular mechanisms that regulate determination and differentiation processes. 4. Establishment of embryonic axes. 5. Examples of mechanisms of morphogenesis and organogenesis. 6. Interrelations between ontogeny and evolution. 7. Physiological aspects of the developmental processes discussed.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 30 to 60 minutes) including multiple choice questions		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) Bachelor's degree (1 major, 1 minor) Biology (Minor, 2010)		

Application-oriented Subject Chemistry

(40 ECTS credits)

Application-oriented Subject Chemistry Compulsory Courses

(26 ECTS credits)

Module title			Abbreviation
Introduction to Physics for Students of Non-physics-related Minor Subjects			11-EFNF-072-m01
Module coordinator		Module offered by	
Managing Director of the Institute of Applied Physics		Faculty of Physics and Astronomy	
ECTS	Method of grading	Only after succ. compl. of module(s)	
7	numerical grade	--	
Duration	Module level	Other prerequisites	
2 semester	undergraduate	--	
Contents			
Mechanics, vibration theory, thermodynamics, optics, science of electricity, Atomic and Nuclear Physics.			
Intended learning outcomes			
The students have knowledge of the principles of Physics.			
Courses (type, number of weekly contact hours, language — if other than German)			
V + V (no information on SWS (weekly contact hours) and course language available)			
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)			
written examination (approx. 120 minutes)			
Allocation of places			
Only as part of pool of general key skills (ASQ): 10 places. Places will be allocated by lot.			
Additional information			
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Workload			
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Teaching cycle			
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Referred to in LPO I (examination regulations for teaching-degree programmes)			
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Module appears in			
Bachelor' degree (1 major) Biochemistry (2011) Bachelor' degree (1 major) Biochemistry (2013) Bachelor' degree (1 major) Biochemistry (2009) Bachelor' degree (1 major) Biology (2011) Bachelor' degree (1 major) Biology (2007) Bachelor' degree (1 major) Biology (2010) Bachelor' degree (1 major) Chemistry (2007) Bachelor' degree (1 major) Chemistry (2008) Bachelor' degree (1 major) Chemistry (2010) Bachelor' degree (1 major) Chemistry (2009) Bachelor' degree (1 major) Geography (2007) Bachelor' degree (1 major) Geography (2008) Bachelor' degree (1 major) Geography (2010) Bachelor' degree (1 major) Computer Science (2007) Bachelor' degree (1 major) Computer Science (2014) Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Food Chemistry (2009) Bachelor' degree (1 major) Mathematics (2008)			
Bachelor's with 1 major Mathematics (2012)		JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Mathematik - 2012	page 83 / 237

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

Module title		Abbreviation
Physical Chemistry 1		o8-PC1-092-m01
Module coordinator		Module offered by
lecturer of lecture "Grundlagen der Quantenmechanik and Spektroskopie" (Principles of Quantum Mechanics and Spectroscopy)		Institute of Physical and Theoretical Chemistry
ECTS	Method of grading	Only after succ. compl. of module(s)
8	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: successful completion of exercises in the respective classes as specified at the beginning of the course (usually 70% of exercises to be successfully completed) as well as regular attendance of exercises (usually a maximum of 2 incidents of unexcused absence).
Contents		
This module introduces students to the fundamental principles of quantum mechanics. It analyses molecules on the basis of the following models: particle in a box, harmonic oscillator and rigid rotor. As regards spectroscopy, the module focuses on vibrational spectroscopy, angular momentum quantisation, microwave spectroscopy and UV-VIS spectroscopy. In addition, the module discusses linear operators, eigenvalue problems, matrix representation, differential equations, Fourier transform and orthogonal functions as mathematical bases of the topics listed above.		
Intended learning outcomes		
Students are able to explain key models of quantum mechanics and to apply them to molecules. They are able to describe different spectroscopic methods. In addition, students know how to apply the mathematical bases of quantum mechanics.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü + V + Ü (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
a) 1 to 3 written examinations (1 written examination: approx. 90 minutes; 2 written examinations: 60 or 90 minutes each; 3 written examinations: 60 minutes each) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes)		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Biochemistry (2011) Bachelor' degree (1 major) Biochemistry (2013) Bachelor' degree (1 major) Biochemistry (2009) Bachelor' degree (1 major) Chemistry (2010)		
Bachelor's with 1 major Mathematics (2012)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Mathematik - 2012	page 85 / 237

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

Module title		Abbreviation
Introduction to Inorganic Chemistry for Students of Mathematics and other Subjects		o8-CM1-112-m01
Module coordinator		Module offered by
lecturer of lecture "Experimentalchemie" (Experimental Chemistry)		Institute of Inorganic Chemistry
ECTS	Method of grading	Only after succ. compl. of module(s)
6	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	--
Contents		
Fundamental principles of general and inorganic chemistry.		
Intended learning outcomes		
Students have become familiar with the fundamental principles of general and inorganic chemistry.		
Courses (type, number of weekly contact hours, language — if other than German)		
V (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 90 minutes)		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Mathematics (2014) Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Computational Mathematics (2014) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013)		

Module title		Abbreviation
Organic Chemistry 1		o8-OC1-092-m01
Module coordinator		Module offered by
holder of the Professorship of Organic Chemistry		Institute of Organic Chemistry
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: successful completion of exercises in the respective classes as specified at the beginning of the course (usually 70% of exercises to be successfully completed) as well as regular attendance of exercises (usually a maximum of 2 incidents of unexcused absence).
Contents		
This module provides students with an overview of the fundamental principles of organic chemistry. It examines the bonding situation of carbon and introduces students to the nomenclature of simple and moderately complex organic compounds. The module also discusses the fundamental principles of stereochemistry, substitution, addition and elimination reactions as well as synthesis planning.		
Intended learning outcomes		
Students know important categories of substances in organic chemistry. They are able to use different systems of nomenclature to determine simple substance names. Students are able to analyse the stereochemistry of molecules. They are able to describe and formulate some of the most important reactions in organic chemistry. For that purpose, they can analyse and categorise the characteristic reaction conditions and can use them for simple syntheses.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
a) 1 to 3 written examinations (1 written examination: approx. 90 minutes; 2 written examinations: 60 or 90 minutes each; 3 written examinations: 60 minutes each) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes)		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
§ 62 (1) 2. Chemie "Organische und Bioorganische Chemie"		
Module appears in		
Bachelor' degree (1 major) Biochemistry (2011) Bachelor' degree (1 major) Biochemistry (2013) Bachelor' degree (1 major) Biochemistry (2009) Bachelor' degree (1 major) Chemistry (2010) Bachelor' degree (1 major) Chemistry (2009) Bachelor' degree (1 major) Mathematics (2012)		
Bachelor's with 1 major Mathematics (2012)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Mathematik - 2012	page 88 / 237

Bachelor' degree (1 major) Mathematics (2013)
 Bachelor' degree (1 major) Computational Mathematics (2009)
 Bachelor' degree (1 major) Computational Mathematics (2012)
 Bachelor' degree (1 major) Computational Mathematics (2013)
 Bachelor' degree (1 major) FOKUS Chemistry (2011)
 First state examination for the teaching degree Gymnasium Chemistry (2009)

Application-oriented Subject Chemistry Compulsory Electives

(14 ECTS credits)

Module title		Abbreviation
Theoretical Models in Chemistry		o8-TC-092-m01
Module coordinator		Module offered by
lecturer of lecture "Quantenchemie"		Institute of Physical and Theoretical Chemistry
ECTS	Method of grading	Only after succ. compl. of module(s)
3	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: successful completion of exercises in the respective classes as specified at the beginning of the course (usually 70% of exercises to be successfully completed) as well as regular attendance of exercises (usually a maximum of 2 incidents of unexcused absence).
Contents		
This module provides students with deeper insights into advanced topics in quantum chemistry. It focuses on spin, the Pauli principle, Slater determinants, the Hartree-Fock method, correlation energy, configuration interaction and excited states, the Born-Oppenheimer approximation and bonding models of H ₂ ⁺ .		
Intended learning outcomes		
Students are able to describe excited states of molecules with the help of key concepts and models.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
a) 1 to 3 written examinations (1 written examination: approx. 90 minutes; 2 written examinations: approx. 60 or 90 minutes each; 3 written examinations: approx. 60 minutes each) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes)		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Chemistry (2010) Bachelor' degree (1 major) Chemistry (2009) Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Computational Mathematics (2009) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) Bachelor' degree (1 major) FOKUS Chemistry (2011)		

Module title			Abbreviation
Physical and Theoretical Chemistry 3: Symmetry and Quantum Chemistry			o8-PC3-092-m01
Module coordinator		Module offered by	
lecturer of lecture "Quantenchemie"		Institute of Physical and Theoretical Chemistry	
ECTS	Method of grading	Only after succ. compl. of module(s)	
6	numerical grade	--	
Duration	Module level	Other prerequisites	
1 semester	undergraduate	Admission prerequisite to assessment: successful completion of exercises in the respective classes as specified at the beginning of the course (usually 70% of exercises to be successfully completed) as well as regular attendance of exercises (usually a maximum of 2 incidents of unexcused absence).	
Contents			
This module discusses the fundamental principles of quantum chemistry and symmetry in chemistry.			
Intended learning outcomes			
Students have become familiar with the fundamental principles of quantum chemistry and symmetry in chemistry and are able to apply the knowledge they have developed.			
Courses (type, number of weekly contact hours, language — if other than German)			
V + Ü + V + Ü (no information on SWS (weekly contact hours) and course language available)			
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)			
a) 1 to 3 written examinations (1 written examination: 90 minutes; 2 written examinations: 60 or 90 minutes each; 3 written examinations: 60 minutes each) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes)			
Allocation of places			
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Additional information			
--			
Workload			
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Teaching cycle			
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Referred to in LPO I (examination regulations for teaching-degree programmes)			
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Module appears in			
Bachelor' degree (1 major) Biochemistry (2013) Bachelor' degree (1 major) Chemistry (2010) Bachelor' degree (1 major) Chemistry (2009) Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Computational Mathematics (2009) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) Bachelor' degree (1 major) FOKUS Chemistry (2011) First state examination for the teaching degree Grundschule Chemistry (2009) First state examination for the teaching degree Hauptschule Chemistry (2009)			
Bachelor's with 1 major Mathematics (2012)		JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Mathematik - 2012	page 92 / 237

First state examination for the teaching degree Realschule Chemistry (2009)
First state examination for the teaching degree Gymnasium Chemistry (2009)
First state examination for the teaching degree Mittelschule Chemistry (2013)

Module title		Abbreviation
Organic Chemistry 2		o8-OC2-102-m01
Module coordinator		Module offered by
holder of the Chair of Physically Organic Chemistry		Institute of Organic Chemistry
ECTS	Method of grading	Only after succ. compl. of module(s)
9	numerical grade	o8-OC1
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: successful completion of exercises in the respective classes as specified at the beginning of the course (usually 70% of exercises to be successfully completed) as well as regular attendance of exercises (usually a maximum of 2 incidents of unexcused absence).
Contents		
This module introduces students to the rules of aromaticity and discusses specific reactions of aromatics. Using the example of carbonyl compounds, it extends the students' knowledge of substitution, elimination and addition reactions to complex reaction mechanisms. The course also focuses on oxidation and reduction reactions as well as rearrangement. In addition, it introduces students to the spectroscopic methods of infrared spectroscopy, mass spectrometry and NMR spectroscopy.		
Intended learning outcomes		
Students have become familiar with the criteria for aromaticity. They can analyse the varying reactivity of carbonyl compounds. They are able to describe specific reactions of carbonyls and aromatics. For that purpose, they can plan and formulate multi-stage syntheses with complex reaction mechanisms and can transfer them to unknown reactions. Students are able to describe important spectroscopic methods, to evaluate a spectrum and to draw conclusions regarding the molecular structure.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + V + Ü (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
a) 1 to 3 written examinations (1 written examination: approx. 90 minutes; 2 written examinations: approx. 60 or 90 minutes each; 3 written examinations: approx. 60 minutes each) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes) Language of assessment: German, English		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Biochemistry (2011) Bachelor' degree (1 major) Biochemistry (2013) Bachelor' degree (1 major) Chemistry (2010) Bachelor' degree (1 major) Mathematics (2012)		
Bachelor's with 1 major Mathematics (2012)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Mathematik - 2012	page 94 / 237

Bachelor' degree (1 major) Mathematics (2013)
 Bachelor' degree (1 major) Computational Mathematics (2012)
 Bachelor' degree (1 major) Computational Mathematics (2013)
 Bachelor' degree (1 major) FOKUS Chemistry (2011)

Application-oriented Subject Geography

(40 ECTS credits)

Application-oriented Subject Geography - Basics of the Scientific Discipline

(10 ECTS credits)

Module title		Abbreviation
General Physical Geography 1 (Earth System: Exogeneous Dynamics - Geomorphology)		09-PG1ExD-102-m01
Module coordinator		Module offered by
holder of the Professorship of Physical Geography		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		
Introduction to "Physical Geography": basics of exogenous dynamics and geomorphology. Erosion and accumulation processes and accumulation results: gravitative, fluvial, glacial and periglacial, Aeolian, marin, littoral, solution: monoprocessual large forms, e.g. endogenous/tectonic forms like volcanoes, break clod, fold mountains or Aeolian "Draas" (huge dunes), deflation (enclosed) basins; polyprocessual large forms, e.g. glacial series, shape of coastlines, escarpments.		
Intended learning outcomes		
Students dispose over basic knowledge of exogenous dynamics and geomorphology.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + T (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 45 minutes)		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
§ 47 (1) 1. Geographie Physiogeographie § 66 (1) 1. Geographie Physiogeographie		
Module appears in		
Bachelor' degree (1 major) Mathematics (2014) Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor's degree (1 major, 1 minor) Geography (Minor, 2012) Bachelor's degree (1 major, 1 minor) Pre- and Protohistoric Archaeology (2012) Bachelor's degree (2 majors) Pre- and Protohistoric Archaeology (2012)		

Module title		Abbreviation
General Physical Geography 2 (Earth System: Climate System)		09-PG1KS-102-m01
Module coordinator		Module offered by
holder of the Professorship of Climatology		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		
Introduction to "Physical Geography": basics of the climate system: Earth and celestial mechanical basics; radiation and energy; vertical and horizontal movement processes; data sources and appearance of the terrestrial climate system		
Intended learning outcomes		
Students will gain a basic physical understanding of the Earth's climate system.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + T (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 45 minutes)		
Allocation of places		
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Additional information		
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Workload		
--		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
§ 47 (1) 1. Geographie Physiogeographie		
§ 66 (1) 1. Geographie Physiogeographie		
Module appears in		
Bachelor' degree (1 major) Mathematics (2014)		
Bachelor' degree (1 major) Mathematics (2012)		
Bachelor' degree (1 major) Mathematics (2013)		
Bachelor's degree (1 major, 1 minor) Geography (Minor, 2012)		

Module title		Abbreviation
General Physical Geography 3 (Earth System: Endogenic Dynamics)		09-PG1EnD-102-m01
Module coordinator		Module offered by
holder of the Professorship of Geodynamics and Geomaterials Research		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		
Introduction to "Physical Geography": basics of endogenous dynamics: formation/structure of the Earth, features of important rock forming, ecologically important minerals, volcanism/ igneous rocks, plutonism/magma genesis, sediments/ sedimentary rocks, metamorphosis; geological structures, ocean floor, plate tectonics, earthquakes, orogenesis, continental crust, distribution of mineral raw materials		
Intended learning outcomes		
Students dispose over basic knowledge of endogenous dynamics		
Courses (type, number of weekly contact hours, language — if other than German)		
V + T (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 45 minutes)		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
§ 47 (1) 1. Geographie Physiogeographie		
§ 66 (1) 1. Geographie Physiogeographie		
Module appears in		
Bachelor' degree (1 major) Mathematics (2014)		
Bachelor' degree (1 major) Mathematics (2012)		
Bachelor' degree (1 major) Mathematics (2013)		
Bachelor's degree (1 major, 1 minor) Geography (Minor, 2012)		

Module title			Abbreviation
Introduction to the Geography of Cities, Towns and Villages			09-HG1Sl-102-m01
Module coordinator		Module offered by	
holder of the Professorship of Cultural Geography		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			
Introduction to "Settlement Geography".			
Intended learning outcomes			
Students possess knowledge of Urban Geography as well as in Geography of Rural Settlements.			
Courses (type, number of weekly contact hours, language — if other than German)			
V + T (no information on SWS (weekly contact hours) and course language available)			
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)			
written examination (approx. 45 minutes)			
Allocation of places			
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Additional information			
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Workload			
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Teaching cycle			
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Referred to in LPO I (examination regulations for teaching-degree programmes)			
§ 47 (1) 1. Geographie Humangeographie			
§ 66 (1) 1. Geographie Humangeographie			
Module appears in			
Bachelor' degree (1 major) Mathematics (2014)			
Bachelor' degree (1 major) Mathematics (2012)			
Bachelor' degree (1 major) Mathematics (2013)			
Bachelor' degree (1 major) Political and Social Studies (2011)			
Bachelor's degree (1 major, 1 minor) Geography (Minor, 2012)			
Bachelor's degree (1 major, 1 minor) Pre- and Protohistoric Archaeology (2012)			
Bachelor's degree (1 major, 1 minor) Pre- and Protohistoric Archaeology (Minor, 2012)			
Bachelor's degree (2 majors) Pre- and Protohistoric Archaeology (2012)			

Module title		Abbreviation
Introduction to Economic Geography		09-HG1WI-102-m01
Module coordinator		Module offered by
holder of the Professorship of Economic Geography		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		
Introduction to "Economic Geography".		
Intended learning outcomes		
Students possess knowledge of Economic Geography. They are also acquainted with the geographical economic theory, location theory and development theory.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + T (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 45 minutes)		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
§ 47 (1) 1. Geographie Humangeographie		
§ 66 (1) 1. Geographie Humangeographie		
Module appears in		
Bachelor' degree (1 major) Mathematics (2014)		
Bachelor' degree (1 major) Mathematics (2012)		
Bachelor' degree (1 major) Mathematics (2013)		
Bachelor' degree (1 major) Political and Social Studies (2011)		
Bachelor's degree (1 major, 1 minor) Geography (Minor, 2012)		
Bachelor's degree (1 major, 1 minor) Pre- and Protohistoric Archaeology (2012)		
Bachelor's degree (1 major, 1 minor) Pre- and Protohistoric Archaeology (Minor, 2012)		
Bachelor's degree (2 majors) Pre- and Protohistoric Archaeology (2012)		

Module title		Abbreviation
Introduction to Social and Population Geography		09-HG1SO-102-m01
Module coordinator		Module offered by
holder of the Professorship of Social Geography		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		
Introduction to "Social and Population Geography".		
Intended learning outcomes		
Students possess knowledge of Social and Population Geography as well as Civilisation Geographical Research.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + T (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 45 minutes)		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
§ 47 (1) 1. Geographie Humangeographie		
§ 66 (1) 1. Geographie Humangeographie		
Module appears in		
Bachelor' degree (1 major) Mathematics (2014)		
Bachelor' degree (1 major) Mathematics (2012)		
Bachelor' degree (1 major) Mathematics (2013)		
Bachelor' degree (1 major) Political and Social Studies (2011)		
Bachelor's degree (1 major, 1 minor) Geography (Minor, 2012)		
Bachelor's degree (1 major, 1 minor) Pre- and Protohistoric Archaeology (2012)		
Bachelor's degree (1 major, 1 minor) Pre- and Protohistoric Archaeology (Minor, 2012)		
Bachelor's degree (2 majors) Pre- and Protohistoric Archaeology (2012)		

Application-oriented Subject Geography - Special Topics

(10 ECTS credits)

Module title		Abbreviation
Working Methods: Solid Earth System		09-MT3-082-m01
Module coordinator		Module offered by
holder of the Chair of Geodynamics and Geomaterials Research		Institute of Geography and Geology
ECTS	Method of grading	Only after succ. compl. of module(s)
10	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	--
Contents		
Basic observations on geological materials that can already be made in the field and which can lead to a first interpretation of geological processes, which took place, as well as the creation of value of geomaterials. Students will be provided with distinctive features and characteristics of the most important rock-forming and economically relevant minerals by means of chosen visuals. Subsequently, the classification of the most important sedimentary, igneous and metamorphic rock types will be elucidated and practised on the basis of their in the hand-piece identifiable mineral existence and structure. In the following modular section, the understanding of two-dimensional display of three-dimensional display of geological phenomena like the geographical distribution of different rock types or tectonic structures will be developed in form of geological maps and sections as well as simple structural-geological diagrams.		
Intended learning outcomes		
Students are able to identify the most important mineral types and as far as possible, to outline and interpret the rock samples without analytical tools. Moreover, they are able to interpret geological maps correctly and to show geological field observations in map form, profiles and suitable diagrams.		
Courses (type, number of weekly contact hours, language — if other than German)		
This module comprises 2 module components. Information on courses will be listed separately for each module component. <ul style="list-style-type: none"> • 09-MT3-1-082: S (no information on SWS (weekly contact hours) and course language available) • 09-MT3-2-082: Ü (no information on SWS (weekly contact hours) and course language available) 		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
Assessment in this module comprises the assessments in the individual module components as specified below. Unless stated otherwise, successful completion of the module will require successful completion of all individual assessments. <p>Assessment in module component 09-MT3-1-082: Mineral and Rock Identification</p> <ul style="list-style-type: none"> • 5 ECTS, Method of grading: numerical grade • written or oral examination of one candidate each (30 minutes each) <p>Assessment in module component 09-MT3-2-082: Geological Maps and Structures</p> <ul style="list-style-type: none"> • 5 ECTS, Method of grading: numerical grade • written or oral examination of one candidate each (approx. 30 minutes each) or term paper (approx. 20 pages) 		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle
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Referred to in LPO I (examination regulations for teaching-degree programmes)
§ 66 (1) 2. Geographie Methoden der Geographie
Module appears in
<p>Bachelor' degree (1 major) Geography (2008)</p> <p>Bachelor' degree (1 major) Geography (2010)</p> <p>Bachelor' degree (1 major) Mathematics (2008)</p> <p>Bachelor' degree (1 major) Mathematics (2012)</p> <p>Bachelor' degree (1 major) Mathematics (2013)</p> <p>Bachelor's degree (1 major, 1 minor) Geography (Minor, 2012)</p> <p>Bachelor's degree (1 major, 1 minor) Geography (Focus Physical Geography) (2010)</p> <p>Bachelor's degree (2 majors) Geography (2010)</p>

Module title		Abbreviation
Theories and Methodology in Human Geography		09-MT2-082-m01
Module coordinator		Module offered by
holder of the Professorship of Cultural Geography		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		
This course will introduce students to general theory of science and geographical specific theory, discussion of different perspectives of research and methodologies, basics of empirical study in analytical and prescriptive sciences.		
Intended learning outcomes		
Students possess knowledge of theoretical and methodological basics. Students are acquainted with empirical research methods as well as models and modelling to Human Geography.		
Courses (type, number of weekly contact hours, language — if other than German)		
S (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (45 minutes) and presentation (approx. 20 minutes), weighted 1:1		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
§ 66 (1) 2. Geographie Methoden der Geographie		
Module appears in		
Bachelor' degree (1 major) Geography (2008) Bachelor' degree (1 major) Geography (2010) Bachelor' degree (1 major) Mathematics (2008) Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor's degree (1 major, 1 minor) Geography (Minor, 2012) Bachelor's degree (1 major, 1 minor) Geography (Focus Human Geography) (2010) Bachelor's degree (2 majors) Geography (2010)		

Module title		Abbreviation
Special Issues of Human Geography 1		09-HG2T1-102-m01
Module coordinator		Module offered by
holder of the Professorship of Social Geography		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		
This module deals with and consolidates chosen issues of "Theoretical and Applied Human Geography" from a sub-area of "Human Geography".		
Intended learning outcomes		
Students are familiar with technical theories and have solid knowledge of a sub-area of Human Geography and their application-oriented implementation. They are acquainted with the production of seminar papers on the basis of independent literature work as well as presentation of the seminar papers in a freely hold presentation.		
Courses (type, number of weekly contact hours, language — if other than German)		
S (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
presentation (approx. 30 minutes) with written elaboration (approx. 20 pages), weighted 1:1		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor's degree (1 major, 1 minor) Geography (Minor, 2012) Bachelor's degree (1 major, 1 minor) Geography (Focus Physical Geography) (2010) Bachelor's degree (1 major, 1 minor) Geography (Focus Human Geography) (2010) Bachelor's degree (2 majors) Geography (2010)		

Module title		Abbreviation
Quantitative and Qualitative Regional Analysis		09-MT4-102-m01
Module coordinator		Module offered by
holder of the Professorship of Social Geography		Institute of Geography and Geology
ECTS	Method of grading	Only after succ. compl. of module(s)
10	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	--
Contents		
This module includes processes of quantitative regional research, multivariate statistical processes, processes of geographical modelling and simulation. Processes of qualitative social and regional research. Presentation and discussion of methods, criticism of methods. Application of methods based on typical examples.		
Intended learning outcomes		
Students possess the following skills: The students' process-related skills will be applied to regional and analytical methods as well as the skills concerning the assessment and evaluation of the processes application and efficiency.		
Courses (type, number of weekly contact hours, language — if other than German)		
This module comprises 2 module components. Information on courses will be listed separately for each module component. <ul style="list-style-type: none"> 09-MT4-1-102: S (no information on SWS (weekly contact hours) and course language available) 09-MT4-2-102: S (no information on SWS (weekly contact hours) and course language available) 		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
Assessment in this module comprises the assessments in the individual module components as specified below. Unless stated otherwise, successful completion of the module will require successful completion of all individual assessments.		
Assessment in module component 09-MT4-1-102: Quantitative Regional Analysis <ul style="list-style-type: none"> 5 ECTS, Method of grading: numerical grade presentation (approx. 30 minutes) with written elaboration (approx. 20 pages), weighted 1:1 Assessment in module component 09-MT4-2-102: Qualitative Regional Analysis <ul style="list-style-type: none"> 5 ECTS, Method of grading: numerical grade a) presentation (approx. 30 minutes) with written elaboration (approx. 20 pages), weighted 1:1 or b) 2 short presentations (10 minutes each) and one portfolio (including approx. 5 logs of practical exercises as well as approx. 3 exercises), weighted 1:1:2 		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
§ 66 (1) 2. Geographie Methoden der Geographie		
Module appears in		
Bachelor' degree (1 major) Geography (2010)		
Bachelor's with 1 major Mathematics (2012)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Mathematik - 2012	page 109 / 237

Bachelor' degree (1 major) Mathematics (2012)
 Bachelor' degree (1 major) Mathematics (2013)
 Bachelor's degree (1 major, 1 minor) Geography (Minor, 2012)
 Bachelor's degree (1 major, 1 minor) Geography (Focus Human Geography) (2010)
 Bachelor's degree (2 majors) Geography (2010)

Module title		Abbreviation
Special Issues of Human Geography 2		09-HG2T2-102-m01
Module coordinator		Module offered by
holder of the Professorship of Social Geography		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		
This module deals with and consolidates chosen issues of "Theoretical and Applied Human Geography" from a sub-area of "Human Geography".		
Intended learning outcomes		
Students are familiar with technical theories and have solid knowledge of a sub-area of Human Geography and their application-oriented implementation. They are acquainted with the production of seminar papers on the basis of independent literature work as well as presentation of the seminar papers in a freely hold presentation.		
Courses (type, number of weekly contact hours, language — if other than German)		
S (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
presentation (approx. 30 minutes) with written elaboration (approx. 20 pages), weighted 1:1		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor's degree (1 major, 1 minor) Geography (Minor, 2012) Bachelor's degree (1 major, 1 minor) Geography (Focus Physical Geography) (2010) Bachelor's degree (1 major, 1 minor) Geography (Focus Human Geography) (2010) Bachelor's degree (2 majors) Geography (2010)		

Module title		Abbreviation
Applied Human Geography		09-HG3-102-m01
Module coordinator		Module offered by
holder of the Professorship of Social Geography		Institute of Geography and Geology
ECTS	Method of grading	Only after succ. compl. of module(s)
10	numerical grade	09-HG1 and 09-MT2 and 09-MT4 and 09-STAT-1 and 09-KART-1 and either 09-STAT-2 or 09-KART-2
Duration	Module level	Other prerequisites
1 semester	undergraduate	--
Contents		
Students will choose a topic of "Human Geography" and attend a project seminar: data collection, data analysis and presentation of explored issues.		
Intended learning outcomes		
<p>Students possess the following skills:</p> <ul style="list-style-type: none"> -Application of the already acquired technical and methodological basics of practice-oriented issues of geographical planning and development using empirical research methods; -Elaboration of action-oriented solutions; -Presentation of results; -Knowledge concerning the use of empirical survey and analysis methodology, project work, team spirit, results-oriented methods, acquisition of communicative technique skills. 		
Courses (type, number of weekly contact hours, language — if other than German)		
<p>This module comprises 2 module components. Information on courses will be listed separately for each module component.</p> <ul style="list-style-type: none"> • 09-HG3-1-082: S (no information on SWS (weekly contact hours) and course language available) • 09-HG3-2-102: S (no information on SWS (weekly contact hours) and course language available) 		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
<p>Assessment in this module comprises the assessments in the individual module components as specified below. Unless stated otherwise, successful completion of the module will require successful completion of all individual assessments.</p> <p>Assessment in module component 09-HG3-1-082: Project-oriented Seminar 1 for Applied Human Geography</p> <ul style="list-style-type: none"> • 5 ECTS, Method of grading: numerical grade • presentation (approx. 30 minutes) with written elaboration (approx. 20 pages), weighted 1:1 <p>Assessment in module component 09-HG3-2-102: Project-oriented Seminar 2 for Applied Human Geography</p> <ul style="list-style-type: none"> • 5 ECTS, Method of grading: numerical grade • presentation (approx. 30 minutes) with written elaboration (approx. 20 pages), weighted 1:1 		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in

Bachelor' degree (1 major) Geography (2010)
 Bachelor' degree (1 major) Mathematics (2012)
 Bachelor' degree (1 major) Mathematics (2013)
 Bachelor's degree (1 major, 1 minor) Geography (Focus Human Geography) (2010)

Module title		Abbreviation
Remote Sensing 1		09-FERN1-102-m01
Module coordinator		Module offered by
holder of the Chair of Remote Sensing		Institute of Geography and Geology
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	--
Contents		
Introduction to "Geographical Remote Sensing".		
Intended learning outcomes		
Students possess the following skills: Theoretical basics of the Remote Sensing System, Remote Sensing against the background of different sensor and platform specifications.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + T (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 45 minutes)		
Allocation of places		
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Additional information		
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Workload		
--		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
§ 66 (1) 2. Geographie Methoden der Geographie		
Module appears in		
Bachelor' degree (1 major) Computer Science (2014) Bachelor' degree (1 major) Mathematics (2014) Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor's degree (1 major, 1 minor) Geography (Minor, 2012) Bachelor's degree (1 major, 1 minor) Geography (Focus Physical Geography) (2010) Bachelor's degree (1 major, 1 minor) Geography (Focus Human Geography) (2010) Bachelor's degree (2 majors) Geography (2010)		

Module title		Abbreviation
Remote Sensing 2		09-FERN2-102-m01
Module coordinator		Module offered by
holder of the Chair of Remote Sensing		Institute of Geography and Geology
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	--
Contents		
Application of Remote Sensing to Geography.		
Intended learning outcomes		
Students have skills of current geographical fields of application concerning the cross-sectional methodology, consolidation of application possibilities of different sensor and platform specifications.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + T (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 45 minutes)		
Allocation of places		
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Additional information		
--		
Workload		
--		
Teaching cycle		
--		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Computer Science (2014) Bachelor' degree (1 major) Mathematics (2014) Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor's degree (1 major, 1 minor) Geography (Minor, 2012) Bachelor's degree (1 major, 1 minor) Geography (Focus Physical Geography) (2010) Bachelor's degree (1 major, 1 minor) Geography (Focus Human Geography) (2010) Bachelor's degree (2 majors) Geography (2010)		

Module title		Abbreviation
Special Problems of Physical Geography 1		09-PG2T1-102-m01
Module coordinator		Module offered by
holder of the Chair of Physical Geography		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		
This module covers synthesis and networking of physical-geographical factors in the light of different methodical approaches and particularly on the basis of the human impact: geomorphology, climate, soil, hydro geography, global change and past global change incl. geo and ecosystem research and ecosystem prediction as well as the cycle of materials on Earth's surface.		
Intended learning outcomes		
Students are acquainted with the synthesis and interconnectedness of skills that have already been acquired concerning the processes on Earth's surface, which are dominating the landscape on Earth's surface and are driven by the geological factors rock, relief, climate, soil, water, flora and fauna. These processes determine structure, function and dynamics of the natural environment and its anthropogenic transformation (the environment that has been shaped from humans by land utilisation, settlements, transport routes etc.). Through the quantitative acquisition of current process structures, Physical Geography is not only able to derive predications for the capability and capacity of geological systems, but also to predict changes in future by analysing the development and change of geographical territories in the past. These important planning decision-making bases concerning the management as well as the sustainable use and development, are given weight to the task of Physical Geography in the practical area.		
Courses (type, number of weekly contact hours, language — if other than German)		
V (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 45 minutes)		
Allocation of places		
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Additional information		
--		
Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor's degree (1 major, 1 minor) Geography (Minor, 2012) Bachelor's degree (1 major, 1 minor) Geography (Focus Physical Geography) (2010) Bachelor's degree (1 major, 1 minor) Geography (Focus Human Geography) (2010) Bachelor's degree (2 majors) Geography (2010)		

Module title		Abbreviation
Special Problems of Physical Geography 2		09-PG2T2-102-m01
Module coordinator		Module offered by
holder of the Chair of Physical Geography		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		
This module covers synthesis and networking of physical-geographical factors in the light of different methodical approaches and particularly on the basis of the human impact: geomorphology, climate, soil, hydro geography, global change and past global change incl. geo and ecosystem research and ecosystem prediction as well as the cycle of materials on Earth's surface.		
Intended learning outcomes		
Students are acquainted with the synthesis and interconnectedness of skills that have already been acquired concerning the processes on Earth's surface, which are dominating the landscape on Earth's surface and are driven by the geological factors rock, relief, climate, soil, water, flora and fauna. These processes determine structure, function and dynamics of the natural environment and its anthropogenic transformation (the environment that has been shaped from humans by land utilisation, settlements, transport routes etc.). Through the quantitative acquisition of current process structures, Physical Geography is not only able to derive predications for the capability and capacity of geological systems, but also to predict changes in future by analysing the development and change of geographical territories in the past. These important planning decision-making bases concerning the management as well as the sustainable use and development, are given weight to the task of Physical Geography in the practical area.		
Courses (type, number of weekly contact hours, language — if other than German)		
S (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
presentation (approx. 30 minutes) with written elaboration (approx. 20 pages), weighted 1:1		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor's degree (1 major, 1 minor) Geography (Minor, 2012) Bachelor's degree (1 major, 1 minor) Geography (Focus Physical Geography) (2010) Bachelor's degree (1 major, 1 minor) Geography (Focus Human Geography) (2010) Bachelor's degree (2 majors) Geography (2010)		

Module title		Abbreviation
Data Acquisition and Processing in Physical Geography		09-MT1-102-m01
Module coordinator		Module offered by
holder of the Chair of Physical Geography		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		
Consolidation of methodical knowledge concerning the collection and processing of data sets, which will be ad- duced in "Physical Geography" as a typical example in order to understand the natural environment; Advanced students can attend alternative seminars, in which applications from the areas ground climatology, climate mo- delling, geophysical methods, soil science of fields, remote sensing and GIS (geographic information system) will be offered optionally.		
Intended learning outcomes		
Students have advanced knowledge of the area basic principles, methodology, cartography and EDP (if necessa- ry statistics, too), which are gained by means of a precise task. Thus, each form of data collection in the field or the modelling at the computer with different stages of data processing in the lab or at the computer will be lin- ked together in order to teach the practical dealing with geophysical measurement methods as well as the dea- ling with different software applications.		
Courses (type, number of weekly contact hours, language — if other than German)		
S (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
presentation (approx. 15 minutes) with written elaboration (15 pages), weighted 1:1		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Geography (2010) Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor's degree (1 major, 1 minor) Geography (Minor, 2012) Bachelor's degree (1 major, 1 minor) Geography (Focus Physical Geography) (2010) Bachelor's degree (2 majors) Geography (2010)		

Module title		Abbreviation
Applied Physical Geography		09-PG3-102-m01
Module coordinator		Module offered by
holder of the Chair of Physical Geography		Institute of Geography and Geology
ECTS	Method of grading	Only after succ. compl. of module(s)
10	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	--
Contents		
Students will choose a topic of "Physical Geography" and attend a project seminar: data collection, data analysis and presentation of explored issues.		
Intended learning outcomes		
Students know how to use their skills, which they have already acquired in the area basics and methods, in order to implement them practically. Based on a specific issue, which is partly integrated in a current research project, process steps of geographical research and method will be undergone. Students are acquainted with the data collection in the field or the modelling at the computer, the application of statistical processes, the cartographic visualisation and presentation in form of lectures, posters, films, Internet or reports. They also possess the ability to work independently.		
Courses (type, number of weekly contact hours, language — if other than German)		
This module comprises 2 module components. Information on courses will be listed separately for each module component. <ul style="list-style-type: none"> 09-PG3-1-082: S (no information on SWS (weekly contact hours) and course language available) 09-PG3-2-102: S (no information on SWS (weekly contact hours) and course language available) 		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
Assessment in this module comprises the assessments in the individual module components as specified below. Unless stated otherwise, successful completion of the module will require successful completion of all individual assessments.		
Assessment in module component 09-PG3-1-082: Project Seminar: Establishing Current Status and Data Acquisition <ul style="list-style-type: none"> 5 ECTS, Method of grading: numerical grade presentation (30 minutes) with written elaboration (20 pages), weighted 1:1 Assessment in module component 09-PG3-2-102: Project Seminar: Data Evaluation, Data Visualisation and Presentation <ul style="list-style-type: none"> 5 ECTS, Method of grading: numerical grade project report (approx. 20 pages) 		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in

Bachelor' degree (1 major) Geography (2010)
 Bachelor' degree (1 major) Mathematics (2012)
 Bachelor' degree (1 major) Mathematics (2013)
 Bachelor's degree (1 major, 1 minor) Geography (Focus Physical Geography) (2010)

Module title		Abbreviation
Cartography 1		09-KART1-102-m01
Module coordinator		Module offered by
holder of the Professorship of Cultural Geography		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		
Introduction to "Cartography" and to the "Collection and Processing of Geodata".		
Intended learning outcomes		
Students possess the following skills: Basics of cartography and use of geodata.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + T (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 75 minutes) and practice work (approx. 30 hours for creating approx. 3 maps or diagrams); weighted 1:1		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
§ 66 (1) 2. Geographie Methoden der Geographie		
Module appears in		
Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Master's degree (1 major) General and Applied Linguistics (2012) Bachelor's degree (1 major, 1 minor) Geography (Minor, 2012) Bachelor's degree (1 major, 1 minor) Pre- and Protohistoric Archaeology (2012) Bachelor's degree (2 majors) Pre- and Protohistoric Archaeology (2012) Bachelor's degree (2 majors) Geography (2010)		

Module title		Abbreviation
Working Methods of Physical Geography		09-MT5-102-m01
Module coordinator		Module offered by
holder of the Chair of Physical Geography		Institute of Geography and Geology
ECTS	Method of grading	Only after succ. compl. of module(s)
10	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	--
Contents		
Field course: basic principles of physical-geographical field, mapping and measuring method (geomorphology, soil geography, vegetation geography, hydro geography, climatology); 10 days of fieldwork. Practical exercise: data preparation, analysis and interpretation; Synthesis of partial results, visualisation and presentation of data with the help of the GIS discussion and the production of a final report.		
Intended learning outcomes		
Students possess the fundamental physical-geographical mapping, measurement and lab methods. They have skills of the difficulties of field, measurement and lab works and possess an overview of analysis and interpretation possibilities of the acquired field and lab data. They possess the visualisation and presentation of geodata and have the ability of networked considerations and of discussing the results scientifically.		
Courses (type, number of weekly contact hours, language — if other than German)		
This module comprises 2 module components. Information on courses will be listed separately for each module component. <ul style="list-style-type: none"> 09-MT5-1-082: P (no information on SWS (weekly contact hours) and course language available) 09-MT5-2-102: S (no information on SWS (weekly contact hours) and course language available) 		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
Assessment in this module comprises the assessments in the individual module components as specified below. Unless stated otherwise, successful completion of the module will require successful completion of all individual assessments.		
Assessment in module component 09-MT5-1-082: Introduction to physiogeographical Fieldwork Skills, Field Mapping and Measuring <ul style="list-style-type: none"> 5 ECTS, Method of grading: numerical grade placement report / fieldwork report / report on practical training / report on practical course / project report / report on technical course (approx. 15 pages) Assessment in module component 09-MT5-2-102: Data management, -analysis and -interpretation <ul style="list-style-type: none"> 5 ECTS, Method of grading: numerical grade presentation of project (approx. 30 minutes) with written elaboration (approx. 20 pages) 		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in

Bachelor' degree (1 major) Geography (2010)
Bachelor' degree (1 major) Mathematics (2012)
Bachelor' degree (1 major) Mathematics (2013)

Module title		Abbreviation
Methods of Planning in Human Geography		09-MT6-102-m01
Module coordinator		Module offered by
holder of the Professorship of Cultural Geography		Institute of Geography and Geology
ECTS	Method of grading	Only after succ. compl. of module(s)
10	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	--
Contents		
Application of empirical research methods on practice-oriented issues on geographical planning and development, development of action-oriented problem solving, presentation of the results.		
Intended learning outcomes		
Students possess the following skills: Application of empirical survey and analysis methodology concerning regional development planning and regional or spatial development, project work, the ability to work in a team, result-oriented methods, communicative techniques.		
Courses (type, number of weekly contact hours, language — if other than German)		
This module comprises 2 module components. Information on courses will be listed separately for each module component. <ul style="list-style-type: none"> 09-MT6-1-082: S (no information on SWS (weekly contact hours) and course language available) 09-MT6-2-102: S (no information on SWS (weekly contact hours) and course language available) 		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
Assessment in this module comprises the assessments in the individual module components as specified below. Unless stated otherwise, successful completion of the module will require successful completion of all individual assessments.		
Assessment in module component 09-MT6-1-082: Methods of Planning in Human Geography 1 <ul style="list-style-type: none"> 5 ECTS, Method of grading: numerical grade a) presentation (approx. 25 minutes) with written elaboration (approx. 12 pages), weighted 1:1 or b) term paper (approx. 20 pages) or c) several small assessments (total length/expenditure of time comparable to a) and/or b)), weighted 1:1 Assessment in module component 09-MT6-2-102: Planning Methods in Human Geography 2 <ul style="list-style-type: none"> 5 ECTS, Method of grading: numerical grade a) presentation (approx. 25 minutes) with written elaboration (approx. 12 pages) or b) term paper (approx. 20 pages) or c) several small assessments (total length/expenditure of time comparable to a) and/or b)) 		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Geography (2010)		
Bachelor's with 1 major Mathematics (2012)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Mathematik - 2012	page 124 / 237

Bachelor' degree (1 major) Mathematics (2012)
Bachelor' degree (1 major) Mathematics (2013)

Application-oriented Subject Computer Science

(40 ECTS credits)

Module title		Abbreviation
Algorithmic Graph Theory		10-I-AGT-122-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	Where applicable, prerequisites as specified by the lecturer at the beginning of the course (e. g. completion of exercises).
Contents		
We discuss typical graph problems: We solve round trip problems, calculate maximal flows, find matchings and colourings, work with planar graphs and find out how the ranking algorithm of Google works. Using the examples of graph problems, we also become familiar with new concepts, for example how we model problems as linear programs or how we show that they are fixed parameter computable.		
Intended learning outcomes		
The students are able to model typical problems in computer science as graph problems. In addition, the participants are able to decide which tool from the course helps solve a given graph problem algorithmically. In this course, students learn in detail how to estimate the run time of given graph algorithms.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 50 to 60 minutes); if announced by the lecturer by four weeks prior to the examination date, the written examination can be replaced by an oral examination of one candidate each or an oral examination in groups (one candidate each: 15 minutes, groups of 2: 20 minutes, groups of 3: 25 minutes) Language of assessment: English, German if agreed upon with the examiner		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) Master's degree (1 major) Mathematics (2012) Master's degree (1 major) Computational Mathematics (2012)		

Module title		Abbreviation
Algorithm and data structures		10-I-ADS-102-m01
Module coordinator		Module offered by
Dean of Studies Informatik (Computer Science)		Institute of Computer Science
ECTS	Method of grading	Only after succ. compl. of module(s)
10	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: exercises (type and scope to be announced by the lecturer at the beginning of the course).
Contents		
Design and analysis of algorithms, recursion vs. iteration, sort and search methods, data structures, abstract data types, lists, trees, graphs, basic graph algorithms, programming in Java.		
Intended learning outcomes		
The students are able to independently design algorithms as well as to precisely describe and analyse them. The students are familiar with the basic paradigms of the design of algorithms and are able to apply them in practical programs. The students are able to estimate the run-time behaviour of algorithms and to prove their correctness.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 80 to 90 minutes). If announced by the lecturer by four weeks prior to the examination date, the written examination can be replaced by an oral examination of one candidate each or an oral examination in groups. A 80 to 90 minute written examination is equivalent to a 20 minute (approx.) oral examination of one candidate each, a 30 minute (approx.) oral examination in groups of 2 and a 40 minute (approx.) oral examination in groups of 3.		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
§ 49 (1) 1. a) Informatik Theoretische Informatik, Algorithmen und Datenstrukturen § 69 (1) 1. a) Informatik Theoretische Informatik, Algorithmen und Datenstrukturen		
Module appears in		
Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Economathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) Master's degree (1 major) Digital Humanities (2011) First state examination for the teaching degree Realschule Computer Science (2012) First state examination for the teaching degree Gymnasium Computer Science (2009)		
Bachelor's with 1 major Mathematics (2012)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Mathematik - 2012	page 128 / 237

Module title		Abbreviation
Software Technology		10-I-ST-102-m01
Module coordinator		Module offered by
Dean of Studies Informatik (Computer Science)		Institute of Computer Science
ECTS	Method of grading	Only after succ. compl. of module(s)
10	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: exercises (type and scope to be announced by the lecturer at the beginning of the course).
Contents		
Object-oriented software development with UML, development of graphical user interfaces, foundations of databases and object-relational mapping, foundations of web programming (HTML, XML), software development processes, unified process, agile software development, project management, quality assurance.		
Intended learning outcomes		
The students possess a fundamental theoretical and practical knowledge on the design and development of software systems.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 80 to 90 minutes). If announced by the lecturer by four weeks prior to the examination date, the written examination can be replaced by an oral examination of one candidate each or an oral examination in groups. A 80 to 90 minute written examination is equivalent to a 20 minute (approx.) oral examination of one candidate each, a 30 minute (approx.) oral examination in groups of 2 and a 40 minute (approx.) oral examination in groups of 3.		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
§ 49 (1) 1. b) Datenbanksysteme und Softwaretechnologie § 69 (1) 1. b) Datenbanksysteme und Softwaretechnologie		
Module appears in		
Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Economathematics (2012) Bachelor' degree (1 major) Business Information Systems (2013) Bachelor' degree (1 major) Human-Computer Systems (2010) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) Bachelor' degree (1 major) Aerospace Computer Science (2009)		
Bachelor's with 1 major Mathematics (2012)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Mathematik - 2012	page 129 / 237

Bachelor' degree (1 major) Aerospace Computer Science (2011)
First state examination for the teaching degree Realschule Computer Science (2012)
First state examination for the teaching degree Gymnasium Computer Science (2009)

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

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

Module title		Abbreviation
Digital computer systems		10-I-RAL-102-m01
Module coordinator		Module offered by
Dean of Studies Informatik (Computer Science)		Institute of Computer Science
ECTS	Method of grading	Only after succ. compl. of module(s)
10	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: exercises (type and scope to be announced by the lecturer at the beginning of the course).
Contents		
Introduction to digital technologies, Boolean algebras, combinatory circuits, synchronous and asynchronous circuits, hardware description languages, structure of a simple processor, machine programming, memory hierarchy.		
Intended learning outcomes		
The students possess a knowledge of the fundamentals of digital technologies up to the design and programming of easy microprocessors as well as knowledge for the application of hardware description languages for the design of digital systems.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 80 to 90 minutes). If announced by the lecturer by four weeks prior to the examination date, the written examination can be replaced by an oral examination of one candidate each or an oral examination in groups. A 80 to 90 minute written examination is equivalent to a 20 minute (approx.) oral examination of one candidate each, a 30 minute (approx.) oral examination in groups of 2 and a 40 minute (approx.) oral examination in groups of 3.		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
§ 69 (1) 1. c) Informatik Technische Informatik		
Module appears in		
Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) First state examination for the teaching degree Gymnasium Computer Science (2009)		

Module title		Abbreviation
Information Transmission		10-I-Ü-102-m01
Module coordinator		Module offered by
holder of the Chair of Computer Science III		Institute of Computer Science
ECTS	Method of grading	Only after succ. compl. of module(s)
10	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: exercises (type and scope to be announced by the lecturer at the beginning of the course).
Contents		
Introduction to probability calculus, coding theory, coding for fault detection and fault correction, information theory, spectrum and Fourier transform, modulation technique, structure of digital transmission systems, introduction to the structure of computer networks, communication protocols.		
Intended learning outcomes		
The students possess a technical, theoretical and practical knowledge of the structure of systems for information transmission, a knowledge that is necessary to understand these systems.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 80 to 90 minutes). If announced by the lecturer by four weeks prior to the examination date, the written examination can be replaced by an oral examination of one candidate each or an oral examination in groups. A 80 to 90 minute written examination is equivalent to a 20 minute (approx.) oral examination of one candidate each, a 30 minute (approx.) oral examination in groups of 2 and a 40 minute (approx.) oral examination in groups of 3.		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
§ 69 (1) 1. c) Informatik Technische Informatik		
Module appears in		
Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) Bachelor' degree (1 major) Aerospace Computer Science (2009) Bachelor' degree (1 major) Aerospace Computer Science (2011) First state examination for the teaching degree Gymnasium Computer Science (2009)		

Module title		Abbreviation
Theoretical informatics		10-I-TI-102-m01
Module coordinator		Module offered by
Dean of Studies Informatik (Computer Science)		Institute of Computer Science
ECTS	Method of grading	Only after succ. compl. of module(s)
10	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: exercises (type and scope to be announced by the lecturer at the beginning of the course).
Contents		
Computability, decidability, countability, complexity of calculations, Boolean functions and circuits, finite automata and regular sets, generative grammars, context-free languages, context-sensitive languages.		
Intended learning outcomes		
The students possess fundamental and applicable knowledge in the area of computability, decidability, countability, complexity of calculations, Boolean functions and circuits, finite automata and regular sets, generative grammars, context free languages, context sensitive languages.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 80 to 90 minutes). If announced by the lecturer by four weeks prior to the examination date, the written examination can be replaced by an oral examination of one candidate each or an oral examination in groups. A 80 to 90 minute written examination is equivalent to a 20 minute (approx.) oral examination of one candidate each, a 30 minute (approx.) oral examination in groups of 2 and a 40 minute (approx.) oral examination in groups of 3.		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
§ 49 (1) 1. a) Informatik Theoretische Informatik, Algorithmen und Datenstrukturen § 69 (1) 1. a) Informatik Theoretische Informatik, Algorithmen und Datenstrukturen		
Module appears in		
Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) First state examination for the teaching degree Realschule Computer Science (2012) First state examination for the teaching degree Gymnasium Computer Science (2009)		

Module title		Abbreviation
Logic for informatics		10-I-LOG-102-m01
Module coordinator		Module offered by
Dean of Studies Informatik (Computer Science)		Institute of Computer Science
ECTS	Method of grading	Only after succ. compl. of module(s)
6	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: exercises (type and scope to be announced by the lecturer at the beginning of the course).
Contents		
Syntax and semantics of propositional logic, equivalence and normal forms, Horn formulas, SAT, resolution, infinite formula sets, syntax and semantics of predicate logic.		
Intended learning outcomes		
The students are proficient in the following areas: syntax and semantics of propositional logic, equivalence and normal forms, Horn formulas, SAT, resolution, infinite formula sets, syntax and semantics of predicate logic.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 50 to 60 minutes); if announced by the lecturer by four weeks prior to the examination date, the written examination can be replaced by an oral examination of one candidate each or an oral examination in groups (one candidate each: 15 minutes, groups of 2: 20 minutes, groups of 3: 25 minutes)		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) First state examination for the teaching degree Gymnasium Computer Science (2009)		

Module title		Abbreviation
Databases		10-I-DB-102-m01
Module coordinator		Module offered by
Dean of Studies Informatik (Computer Science)		Institute of Computer Science
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: exercises (type and scope to be announced by the lecturer at the beginning of the course).
Contents		
Relational algebra and complex SQL statements; database planning and normal forms; transaction management.		
Intended learning outcomes		
The students possess knowledge about database modelling and queries in SQL as well as transactions.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 50 to 60 minutes) if announced by the lecturer by four weeks prior to the examination date, the written examination can be replaced by an oral examination of one candidate each or an oral examination in groups (one candidate each: 15 minutes, groups of 2: 20 minutes, groups of 3: 25 minutes) Language of assessment: German, English if agreed upon with the examiner		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
§ 49 (1) 1. b) Datenbanksysteme und Softwaretechnologie § 69 (1) 1. b) Datenbanksysteme und Softwaretechnologie		
Module appears in		
Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Business Information Systems (2013) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) Bachelor' degree (1 major) Aerospace Computer Science (2009) Bachelor' degree (1 major) Aerospace Computer Science (2011) Bachelor' degree (1 major) Functional Materials (2012) Master's degree (1 major) Computer Science (2010) Master's degree (1 major) Mathematics (2012)		
Bachelor's with 1 major Mathematics (2012)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Mathematik - 2012	page 137 / 237

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

Module title		Abbreviation
Object-oriented Programming		10-I-OOP-102-m01
Module coordinator		Module offered by
Dean of Studies Informatik (Computer Science)		Institute of Computer Science
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: exercises (type and scope to be announced by the lecturer at the beginning of the course).
Contents		
Polymorphism, generic programming, meta programming, web programming, templates, document management.		
Intended learning outcomes		
The students are proficient in the different paradigms of object-oriented programming and have experience in their practical use.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 50 to 60 minutes); if announced by the lecturer by four weeks prior to the examination date, the written examination can be replaced by an oral examination of one candidate each or an oral examination in groups (one candidate each: 15 minutes, groups of 2: 20 minutes, groups of 3: 25 minutes) Language of assessment: German, English if agreed upon with the examiner		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Business Information Systems (2013) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) Bachelor' degree (1 major) Aerospace Computer Science (2009) Bachelor' degree (1 major) Aerospace Computer Science (2011) Master's degree (1 major) Computer Science (2010) Master's degree (1 major) Physics (2010) Master's degree (1 major) Physics (2011) Master's degree (1 major) Nanostructure Technology (2011)		
Bachelor's with 1 major Mathematics (2012)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Mathematik - 2012	page 139 / 237

Master's degree (1 major) Nanostructure Technology (2010)

Module title		Abbreviation
Theory of Complexity		10-I-KT-102-m01
Module coordinator		Module offered by
Dean of Studies Informatik (Computer Science)		Institute of Computer Science
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: exercises (type and scope to be announced by the lecturer at the beginning of the course).
Contents		
Complexity measurements and classes, general relationships between space and time classes, memory consumption versus computation time, determinism versus indeterminism, hierarchical theorems, translation methods, P-NP problem, completeness problems, Turing reduction, interactive proof systems.		
Intended learning outcomes		
The students possess a fundamental and applicable knowledge in the areas of complexity measurements and classes, general relationships between space and time classes, memory consumption versus computation time, determinism versus indeterminism, hierarchical theorems, translation methods, P-NP problem, completeness problems, Turing reduction, interactive proof systems.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 50 to 60 minutes); if announced by the lecturer by four weeks prior to the examination date, the written examination can be replaced by an oral examination of one candidate each or an oral examination in groups (one candidate each: 15 minutes, groups of 2: 20 minutes, groups of 3: 25 minutes) Language of assessment: German, English if agreed upon with the examiner		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) Bachelor' degree (1 major) Aerospace Computer Science (2009) Bachelor' degree (1 major) Aerospace Computer Science (2011) Master's degree (1 major) Computer Science (2010) Master's degree (1 major) Mathematics (2012)		
Bachelor's with 1 major Mathematics (2012)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Mathematik - 2012	page 141 / 237

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

Module title		Abbreviation
Automation and Control Technology		10-I-AR-102-m01
Module coordinator		Module offered by
holder of the Chair of Computer Science VII		Institute of Computer Science
ECTS	Method of grading	Only after succ. compl. of module(s)
8	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: exercises (type and scope to be announced by the lecturer at the beginning of the course).
Contents		
Overview of automation systems, fundamental principles of control technology, Laplace transformation, transfer function, plant, controller types, basic feedback loop, fundamental principles of control engineering, automata, structure of Petri nets, Petri nets for automisation, machine-related structure of processing computation machines, communication between process computers and periphery devices, software for automation systems, process synchronisation, process communication, real-time operating systems, real-time planning.		
Intended learning outcomes		
The students master the fundamentals of automation and control.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 80 to 90 minutes). If announced by the lecturer by four weeks prior to the examination date, the written examination can be replaced by an oral examination of one candidate each or an oral examination in groups. A 80 to 90 minute written examination is equivalent to a 20 minute (approx.) oral examination of one candidate each, a 30 minute (approx.) oral examination in groups of 2 and a 40 minute (approx.) oral examination in groups of 3. Language of assessment: German, English if agreed upon with the examiner		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) Bachelor' degree (1 major) Aerospace Computer Science (2009) Bachelor' degree (1 major) Aerospace Computer Science (2011) Master's degree (1 major) Computer Science (2010) Master's degree (1 major) Mathematics (2012)		
Bachelor's with 1 major Mathematics (2012)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Mathematik - 2012	page 143 / 237

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

Module title		Abbreviation
Computer Architecture		10-I-RAK-102-m01
Module coordinator		Module offered by
Dean of Studies Informatik (Computer Science)		Institute of Computer Science
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: exercises (type and scope to be announced by the lecturer at the beginning of the course).
Contents		
Instruction set architectures, command processing through pipelining, statical and dynamic instruction scheduling, caches, vector processors, multi-core processors.		
Intended learning outcomes		
The students master the most important techniques to design fast computers as well as their interaction with compilers and operating systems.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 50 to 60 minutes); if announced by the lecturer by four weeks prior to the examination date, the written examination can be replaced by an oral examination of one candidate each or an oral examination in groups (one candidate each: 15 minutes, groups of 2: 20 minutes, groups of 3: 25 minutes) Language of assessment: German, English if agreed upon with the examiner		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
§ 69 (1) 1. c) Informatik Technische Informatik		
Module appears in		
Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) Bachelor' degree (1 major) Aerospace Computer Science (2009) Bachelor' degree (1 major) Aerospace Computer Science (2011) Master's degree (1 major) Computer Science (2010) Master's degree (1 major) Mathematics (2012) Master's degree (1 major) Mathematics (2010) Master's degree (1 major) Physics (2010) Master's degree (1 major) Physics (2011)		
Bachelor's with 1 major Mathematics (2012)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Mathematik - 2012	page 145 / 237

Master's degree (1 major) Nanostructure Technology (2011)
Master's degree (1 major) Nanostructure Technology (2010)
Master's degree (1 major) Computational Mathematics (2012)

Module title		Abbreviation
Computer Networks and Communication Systems		10-I-RK-102-m01
Module coordinator		Module offered by
holder of the Chair of Computer Science III		Institute of Computer Science
ECTS	Method of grading	Only after succ. compl. of module(s)
8	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: exercises (type and scope to be announced by the lecturer at the beginning of the course).
Contents		
Properties of computer and communication systems: data traffic in distributed systems. Performance analysis of computer networks and communication systems: problem statement and introduction to method architecture and structure of computer networks: network structure, network access, access methods, digital transfer hierarchies, dataflow control and traffic control, transfer network. Communication protocols: fundamental principles and ISO architecture models. Internet: structure and basic mechanism, TCP/IP, routing, network management. Mobile communication networks: fundamental concepts, GSM, UMTS. Future communication systems and networks.		
Intended learning outcomes		
The students possess an intricate knowledge of the structure of computer networks and communication systems as well as fundamental principles to rate these systems.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 80 to 90 minutes). If announced by the lecturer by four weeks prior to the examination date, the written examination can be replaced by an oral examination of one candidate each or an oral examination in groups. A 80 to 90 minute written examination is equivalent to a 20 minute (approx.) oral examination of one candidate each, a 30 minute (approx.) oral examination in groups of 2 and a 40 minute (approx.) oral examination in groups of 3. Language of assessment: German, English if agreed upon with the examiner		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) Bachelor' degree (1 major) Aerospace Computer Science (2009)		
Bachelor's with 1 major Mathematics (2012)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Mathematik - 2012	page 147 / 237

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

Master's degree (1 major) Computer Science (2010)

Master's degree (1 major) Mathematics (2012)

Master's degree (1 major) Mathematics (2010)

Master's degree (1 major) Computational Mathematics (2012)

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

Application-oriented Subject Philosophy

(40 ECTS credits)

Application-oriented Subject Philosophy Compulsory Courses

(20 ECTS credits)

Module title		Abbreviation
Philosophy and the sciences		o6-B-P2-102-m01
Module coordinator		Module offered by
holder of the Chair of Theoretical Philosophy		Institute of Philosophy
ECTS	Method of grading	Only after succ. compl. of module(s)
10	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	By way of exception, additional prerequisites are listed in the section on assessments.
Contents		
Introduction to the theory of intellectual disciplines; philosophical bases of the humanities and the social sciences; philosophical bases of the natural sciences and engineering.		
Intended learning outcomes		
Intended learning outcomes: Content-related outcomes: - insight into the relationship of philosophy to individual intellectual disciplines - ability to reflect on the historical and intellectual origins of our knowledge culture - ability to organise topics into overarching historical, social, and political schemata - insight into the scope and limits of various intellectual disciplines - knowledge of, and ability to criticise, basic assumptions in systems of thought, culture, and knowledge Formal outcomes (skills to be tested in assessments): - ability to analyse philosophical texts and issues - ability to organise concepts and philosophical positions into overarching intellectual schemata - ability to present philosophical positions in a structured and linguistically appropriate manner		
Courses (type, number of weekly contact hours, language — if other than German)		
This module comprises 2 module components. Information on courses will be listed separately for each module component. <ul style="list-style-type: none"> o6-B-P2-1-102: V + S (no information on SWS (weekly contact hours) and course language available) o6-B-P2-2-102: V + S (no information on SWS (weekly contact hours) and course language available) 		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
Assessment in this module comprises the assessments in the individual module components as specified below. Unless stated otherwise, successful completion of the module will require successful completion of all individual assessments.		
Assessment in module component o6-B-P2-1-102: Philosophical principles of arts and humanities Philosophical principles of arts and humanities <ul style="list-style-type: none"> 5 ECTS, Method of grading: numerical grade written examination (approx. 90 minutes) Other prerequisites: Admission prerequisite to assessment: regular attendance of seminar (a maximum of 2 incidents of unexcused absence). 		
Assessment in module component o6-B-P2-2-102: Philosophical principles of natural sciences and technology Philosophical principles of natural sciences and technology <ul style="list-style-type: none"> 5 ECTS, Method of grading: numerical grade written examination (approx. 90 minutes) Other prerequisites: Admission prerequisite to assessment: regular attendance of seminar (a maximum of 2 incidents of unexcused absence). 		
Allocation of places		
Only as part of pool of general key skills (ASQ): max. 20 places. Places will be allocated according to the number of subject semesters. Among applicants with the same number of subject semesters, places will be allocated by lot.		
Additional information		
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Workload
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Teaching cycle
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Referred to in LPO I (examination regulations for teaching-degree programmes)
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Module appears in
<p>Bachelor' degree (1 major) Geography (2010)</p> <p>Bachelor' degree (1 major) Mathematics (2012)</p> <p>Bachelor' degree (1 major) Mathematics (2013)</p> <p>Bachelor's degree (1 major, 1 minor) Philosophy (Minor, 2010)</p> <p>Bachelor's degree (1 major, 1 minor) Philosophy (2010)</p> <p>Bachelor's degree (1 major, 1 minor) Philosophy (Minor, 2013)</p> <p>Bachelor's degree (1 major, 1 minor) Philosophy (2013)</p> <p>Bachelor's degree (2 majors) Philosophy (2010)</p> <p>Bachelor's degree (2 majors) Philosophy (2013)</p>

Module title		Abbreviation
Principles of Philosophy		o6-B-P1-122-m01
Module coordinator		Module offered by
holder of the Chair of Practical Philosophy		Institute of Philosophy
ECTS	Method of grading	Only after succ. compl. of module(s)
10	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	By way of exception, additional prerequisites are listed in the section on assessments.
Contents		
Introduction to the systems and the history of philosophy; introduction to academic writing and research in philosophy; introduction to formal logic; insight into a period in the history of philosophy.		
Intended learning outcomes		
Intended learning outcomes: Content-related outcomes: - insight into basic problems and positions in philosophy - knowledge of, and ability to apply, methods in philosophy and ability to follow the rules of scholarly work - mastery of the fundamentals of formal logic - insight into a period in the history of philosophy Formal outcomes (skills to be tested in assessments): - ability to apply the principles of logic to argumentation - ability to apply general principles of argumentation such as transparency, consistency, discursivity, completeness, and generalisability - ability to present philosophical issues in a structured and linguistically and rhetorically appropriate way		
Courses (type, number of weekly contact hours, language — if other than German)		
This module comprises 3 module components. Information on courses will be listed separately for each module component. <ul style="list-style-type: none"> o6-B-P1-1-122: Ü (no information on SWS (weekly contact hours) and course language available) o6-B-P1-2-122: S (no information on SWS (weekly contact hours) and course language available) o6-B-P1-3-122: V + S (no information on SWS (weekly contact hours) and course language available) 		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
Assessment in this module comprises the assessments in the individual module components as specified below. Unless stated otherwise, successful completion of the module will require successful completion of all individual assessments.		
Assessment in module component o6-B-P1-1-122: Introduction to academic working techniques <ul style="list-style-type: none"> 2 ECTS, Method of grading: (not) successfully completed 1 small written assessment (approx. 1 page) and/or 1 oral assessment (approx. 5 minutes) Other prerequisites: Admission prerequisite to assessment: regular attendance of exercises (a maximum of 2 incidents of unexcused absence). 		
Assessment in module component o6-B-P1-2-122: Introduction to formal logic <ul style="list-style-type: none"> 3 ECTS, Method of grading: (not) successfully completed written examination (approx. 90 minutes) Other prerequisites: Admission prerequisite to assessment: regular attendance of seminar (a maximum of 2 incidents of unexcused absence). 		
Assessment in module component o6-B-P1-3-122: Principles of Philosophy: historical epochs, main works, authors Principles of Philosophy: historical epochs, main works, authors <ul style="list-style-type: none"> 5 ECTS, Method of grading: numerical grade oral examination (approx. 25 minutes) Other prerequisites: Admission prerequisite to assessment: regular attendance of seminar (a maximum of 2 incidents of unexcused absence). 		
Allocation of places		
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Additional information
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Workload
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Teaching cycle
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Referred to in LPO I (examination regulations for teaching-degree programmes)
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Module appears in
Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor's degree (1 major, 1 minor) Philosophy (Minor, 2013) Bachelor's degree (1 major, 1 minor) Philosophy (2013) Bachelor's degree (2 majors) Philosophy (2013)

Application-oriented Subject Philosophy Compulsory Electives

(20 ECTS credits)

Module title		Abbreviation
Theoretical Philosophy		o6-B-P3-122-m01
Module coordinator		Module offered by
holder of the Chair of Theoretical Philosophy		Institute of Philosophy
ECTS	Method of grading	Only after succ. compl. of module(s)
10	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: regular attendance of seminars (a maximum of 2 incidents of unexcused absence).
Contents		
Introduction to theoretical philosophy, using basic problems and paradigmatic texts.		
Intended learning outcomes		
Intended learning outcomes: Content-related outcomes: An overview of basic problems and positions in theoretical philosophy; an overview of systems and disciplines in theoretical philosophy; ability to use and distinguish between different methods in theoretical philosophy; familiarity with, and ability to evaluate, methods of argumentation and justification within theoretical philosophy; ability to reflect on the factors involved in the process of theoretical opinion formation. Formal outcomes (skills to be tested in the assessment): Ability to analyse philosophical texts and issues; ability to organise concepts and philosophical positions into overarching intellectual schemata; ability to present philosophical positions in a structured and linguistically appropriate manner.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + S + S (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
oral examination (approx. 25 minutes) in one of the seminars (seminar to be selected by students)		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor's degree (1 major, 1 minor) Philosophy (Minor, 2013) Bachelor's degree (1 major, 1 minor) Philosophy (2013) Bachelor's degree (2 majors) Philosophy (2013)		

Module title		Abbreviation
Practical Philosophy		o6-B-P4-122-mo1
Module coordinator		Module offered by
holder of the Chair of Practical Philosophy		Institute of Philosophy
ECTS	Method of grading	Only after succ. compl. of module(s)
10	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: regular attendance of seminars (a maximum of 2 incidents of unexcused absence).
Contents		
Introduction to practical philosophy, using basic problems and paradigmatic texts.		
Intended learning outcomes		
Intended learning outcomes: Content-related outcomes: An overview of basic problems and positions in practical philosophy; an overview of systems and disciplines in practical philosophy; ability to use and distinguish between different methods in practical philosophy; knowledge of, and ability to evaluate, methods of argumentation and justification within practical philosophy; ability to reflect on the factors involved in the process of moral opinion formation. Formal outcomes (skills to be tested in the assessment): Ability to analyse philosophical texts and issues; ability to organise concepts and philosophical positions into overarching intellectual schemata; ability to present philosophical positions in a structured and linguistically appropriate manner.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + S + S (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 120 minutes) in one of the seminars (seminar to be selected by students)		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Mathematics (2012)		
Bachelor' degree (1 major) Mathematics (2013)		

Module title		Abbreviation
History of Philosophy		o6-B-P5-122-m01
Module coordinator		Module offered by
holder of the Chair of the History of Philosophy		Institute of Philosophy
ECTS	Method of grading	Only after succ. compl. of module(s)
10	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: regular attendance of seminars (a maximum of 2 incidents of unexcused absence).
Contents		
Introduction to the history of philosophy, using basic problems and paradigmatic texts.		
Intended learning outcomes		
Intended learning outcomes: Content-related outcomes: 1. an overview of basic problems and positions in the history of philosophy 2. ability to use and distinguish between different methods of historiography 3. familiarity with, understanding of, and ability to evaluate methods and questions of scholarly inquiry with respect to the history of philosophy Formal outcomes (skills to be tested in the assessment): 4. ability to analyse philosophical texts and positions 5. ability to organise concepts and philosophical positions into overarching intellectual schemata 6. ability to present philosophical positions in a structured and linguistically appropriate manner		
Courses (type, number of weekly contact hours, language — if other than German)		
V + S + S (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 120 minutes) in one of the seminars (seminar to be selected by students)		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Mathematics (2012)		
Bachelor' degree (1 major) Mathematics (2013)		

Module title		Abbreviation
Issues of research in philosophy		o6-B-P6-122-m01
Module coordinator		Module offered by
holder of the Chair of the History of Philosophy		Institute of Philosophy
ECTS	Method of grading	Only after succ. compl. of module(s)
10	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: regular attendance of seminars (a maximum of 2 incidents of unexcused absence).
Contents		
Selected research issues in philosophy.		
Intended learning outcomes		
Intended learning outcomes: Content-related outcomes: Knowledge and understanding of scholarly inquiry in philosophy. Formal outcomes (skills to be tested in the assessment): Ability to analyse philosophical texts and issues; ability to follow the rules of scholarly work; ability to independently develop philosophical issues and to present them in an appropriate manner.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + S + S (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
oral examination (approx. 25 minutes) in one of the seminars (seminar to be selected by students)		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor's degree (1 major, 1 minor) Philosophy (Minor, 2013) Bachelor's degree (1 major, 1 minor) Philosophy (2013) Bachelor's degree (2 majors) Philosophy (2013)		

Module title		Abbreviation
Text Analysis: Ancient Philosophy		o6-B-W1-122-m01
Module coordinator		Module offered by
holder of the Chair of the History of Philosophy		Institute of Philosophy
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: regular attendance of seminar (a maximum of 2 incidents of unexcused absence).
Contents		
Ancient philosophical texts.		
Intended learning outcomes		
Intended learning outcomes: Content-related outcomes: - ability to analyse texts of ancient philosophy while taking into account the historical and intellectual context of their origin - knowledge of, and ability to criticise, basic assumptions in ancient systems of thought, culture, and knowledge Formal outcomes (skills to be tested in the assessment): - ability to analyse philosophical texts and issues - ability to follow the rules of scholarly work (when writing a term paper) - ability to organise historical concepts and philosophical positions into overarching intellectual schemata - ability to independently develop and present philosophical issues		
Courses (type, number of weekly contact hours, language — if other than German)		
S (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 120 minutes) or term paper (approx. 12 pages)		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Mathematics (2012)		
Bachelor' degree (1 major) Mathematics (2013)		

Module title		Abbreviation
Text Analysis: Medieval Philosophy		o6-B-W2-122-m01
Module coordinator		Module offered by
holder of the Chair of the History of Philosophy		Institute of Philosophy
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: regular attendance of seminar (a maximum of 2 incidents of unexcused absence).
Contents		
Medieval philosophical texts.		
Intended learning outcomes		
Intended learning outcomes: Content-related outcomes: Ability to analyse texts of medieval philosophy while taking into account the historical and intellectual context of their origin; knowledge of, and ability to criticise, basic assumptions in pre-modern systems of thought, culture, and knowledge. Formal outcomes (skills to be tested in the assessment): Ability to analyse philosophical texts and issues; ability to follow the rules of scholarly work; ability to independently develop philosophical issues and to present them in an appropriate manner.		
Courses (type, number of weekly contact hours, language — if other than German)		
S (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 120 minutes) or term paper (approx. 12 pages)		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Mathematics (2012)		
Bachelor' degree (1 major) Mathematics (2013)		

Module title		Abbreviation
Text Analysis: Modern Philosophy		o6-B-W3-122-m01
Module coordinator		Module offered by
holder of the Chair of Practical Philosophy		Institute of Philosophy
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: regular attendance of seminar (a maximum of 2 incidents of unexcused absence).
Contents		
Modern philosophical texts.		
Intended learning outcomes		
Intended learning outcomes: Content-related outcomes: Ability to analyse texts of modern philosophy; knowledge of, and ability to criticise, basic assumptions of systems of thought, culture, and knowledge of modernity. Formal outcomes (skills to be tested in the assessment): Ability to analyse philosophical texts and issues; ability to follow the rules of scholarly work; ability to independently develop philosophical issues and to present them in a linguistically appropriate manner.		
Courses (type, number of weekly contact hours, language — if other than German)		
S (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 120 minutes)		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Mathematics (2012)		
Bachelor' degree (1 major) Mathematics (2013)		

Module title		Abbreviation
Text Analysis: Contemporary Philosophy		o6-B-W4-122-m01
Module coordinator		Module offered by
holder of the Chair of Practical Philosophy		Institute of Philosophy
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: regular attendance of seminar (a maximum of 2 incidents of unexcused absence).
Contents		
Contemporary philosophical texts.		
Intended learning outcomes		
Intended learning outcomes: Content-related outcomes: Ability to analyse texts of contemporary philosophy; knowledge of, and ability to criticise, basic assumptions of systems of thought, culture, and knowledge of the contemporary world. Formal outcomes (skills to be tested in the assessment): Ability to analyse philosophical texts and issues; ability to follow the rules of scholarly work; ability to independently develop philosophical issues and to present them in a linguistically appropriate manner.		
Courses (type, number of weekly contact hours, language — if other than German)		
S (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 120 minutes)		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Mathematics (2012)		
Bachelor' degree (1 major) Mathematics (2013)		

Module title		Abbreviation
Basic disciplines of theoretical philosophy		o6-B-W5-122-m01
Module coordinator		Module offered by
holder of the Chair of Theoretical Philosophy		Institute of Philosophy
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: regular attendance of seminar (a maximum of 2 incidents of unexcused absence).
Contents		
Problems in and theoretical models of basic disciplines of theoretical philosophy.		
Intended learning outcomes		
Intended learning outcomes: Content-related outcomes: Insight into the fundamental disciplines of theoretical philosophy. Formal outcomes (skills to be tested in the assessment): Ability to analyse philosophical texts and issues; ability to follow the rules of scholarly work; ability to independently develop philosophical issues and to present them in a linguistically appropriate manner.		
Courses (type, number of weekly contact hours, language — if other than German)		
S (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
term paper (approx. 12 pages)		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor's degree (1 major, 1 minor) Philosophy (2013) Bachelor's degree (2 majors) Philosophy (2013)		

Module title		Abbreviation
Specific disciplines of theoretical philosophy		o6-B-W6-122-m01
Module coordinator		Module offered by
holder of the Chair of Theoretical Philosophy		Institute of Philosophy
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: regular attendance of seminar (a maximum of 2 incidents of unexcused absence).
Contents		
Problems in and theoretical models of special disciplines of theoretical philosophy.		
Intended learning outcomes		
Intended learning outcomes: Content-related outcomes: Insight into special disciplines of theoretical philosophy. Formal outcomes (skills to be tested in the assessment): Ability to analyse philosophical texts and issues; ability to follow the rules of scholarly work; ability to independently develop philosophical issues and to present them in a linguistically appropriate manner.		
Courses (type, number of weekly contact hours, language — if other than German)		
S (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
term paper (approx. 12 pages) or oral examination (approx. 25 minutes)		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor's degree (1 major, 1 minor) Philosophy (2013) Bachelor's degree (2 majors) Philosophy (2013)		

Module title		Abbreviation
Basic disciplines of practical philosophy		o6-B-W7-122-m01
Module coordinator		Module offered by
holder of the Chair of Practical Philosophy		Institute of Philosophy
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: regular attendance of seminar (a maximum of 2 incidents of unexcused absence).
Contents		
Problems in and theoretical models of basic disciplines of practical philosophy.		
Intended learning outcomes		
Intended learning outcomes: Content-related outcomes: Insight into the fundamental disciplines of practical philosophy. Formal outcomes (skills to be tested in the assessment): Ability to analyse philosophical texts and issues; ability to follow the rules of scholarly work; ability to independently develop philosophical issues and to present them in a linguistically appropriate manner.		
Courses (type, number of weekly contact hours, language — if other than German)		
S (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
term paper (approx. 12 pages) or oral examination (approx. 25 minutes)		
Allocation of places		
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Additional information		
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Workload		
--		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor's degree (1 major, 1 minor) Philosophy (2013) Bachelor's degree (2 majors) Philosophy (2013)		

Module title		Abbreviation
Problems of Older Philosophy		o6-B-W9-122-m01
Module coordinator		Module offered by
holder of the Chair of the History of Philosophy		Institute of Philosophy
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: regular attendance of seminar (a maximum of 2 incidents of unexcused absence).
Contents		
Problems in ancient and medieval philosophy.		
Intended learning outcomes		
Intended learning outcomes: Content-related outcomes: Ability to analyse philosophical problems of older philosophy (ancient/medieval); in-depth knowledge of the history of philosophical concepts, arguments, and theories. Formal outcomes (skills to be tested in the assessment): Ability to apply the principles of logic to argumentation; ability to apply general principles of argumentation such as transparency, consistency, discursivity, completeness, and generalisability; ability to present philosophical issues in a structured and linguistically and rhetorically appropriate way.		
Courses (type, number of weekly contact hours, language — if other than German)		
S (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
term paper (approx. 12 pages)		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor's degree (1 major, 1 minor) Philosophy (2013) Bachelor's degree (2 majors) Philosophy (2013)		

Module title		Abbreviation
Specific disciplines of practical philosophy		o6-B-W8-122-m01
Module coordinator		Module offered by
holder of the Chair of Practical Philosophy		Institute of Philosophy
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: regular attendance of seminar (a maximum of 2 incidents of unexcused absence).
Contents		
Problems in and theoretical models of special disciplines of practical philosophy.		
Intended learning outcomes		
Intended learning outcomes: Content-related outcomes: Insight into special disciplines of practical philosophy. Formal outcomes (skills to be tested in the assessment): Ability to analyse philosophical texts and issues; ability to follow the rules of scholarly work; ability to independently develop philosophical issues and to present them in a linguistically appropriate manner.		
Courses (type, number of weekly contact hours, language — if other than German)		
S (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
term paper (approx. 12 pages) or oral examination (approx. 25 minutes)		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor's degree (1 major, 1 minor) Philosophy (2013) Bachelor's degree (2 majors) Philosophy (2013)		

Module title		Abbreviation
Problems of Modern Philosophy		o6-B-W10-122-m01
Module coordinator		Module offered by
holder of the Chair of the History of Philosophy		Institute of Philosophy
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: regular attendance of seminar (a maximum of 2 incidents of unexcused absence).
Contents		
Problems in early modern and contemporary philosophy.		
Intended learning outcomes		
Intended learning outcomes: Content-related outcomes: Ability to analyse philosophical problems of modern philosophy (early modern to contemporary); in-depth knowledge of the history of philosophical concepts, arguments, and theories. Formal outcomes (skills to be tested in the assessment): Ability to apply the principles of logic to argumentation; ability to apply general principles of argumentation such as transparency, consistency, discursivity, completeness, and generalisability; ability to present philosophical issues in a structured and linguistically and rhetorically appropriate way.		
Courses (type, number of weekly contact hours, language — if other than German)		
S (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
term paper (approx. 12 pages)		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor's degree (1 major, 1 minor) Philosophy (2013) Bachelor's degree (2 majors) Philosophy (2013)		

Module title		Abbreviation
Problems of Theoretical Philosophy		o6-B-W11-122-m01
Module coordinator		Module offered by
holder of the Chair of Theoretical Philosophy		Institute of Philosophy
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: regular attendance of seminar (a maximum of 2 incidents of unexcused absence).
Contents		
Problems in theoretical philosophy.		
Intended learning outcomes		
Intended learning outcomes: Content-related outcomes: Advanced knowledge of problems in theoretical philosophy. Formal outcomes (skills to be tested in the assessment): Ability to apply the principles of logic to argumentation; ability to apply general principles of argumentation such as transparency, consistency, discursivity, completeness, and generalisability; ability to present philosophical issues in a structured and linguistically and rhetorically appropriate way.		
Courses (type, number of weekly contact hours, language — if other than German)		
S (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
term paper (approx. 12 pages)		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor's degree (1 major, 1 minor) Philosophy (2013)		

Module title		Abbreviation
Problems of Practical Philosophy		o6-B-W12-122-m01
Module coordinator		Module offered by
holder of the Chair of Practical Philosophy		Institute of Philosophy
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: regular attendance of seminar (a maximum of 2 incidents of unexcused absence).
Contents		
Problems in practical philosophy.		
Intended learning outcomes		
Intended learning outcomes: Content-related outcomes: Advanced knowledge of problems in practical philosophy. Formal outcomes (skills to be tested in the assessment): Ability to apply the principles of logic to argumentation; ability to apply general principles of argumentation such as transparency, consistency, discursivity, completeness, and generalisability; ability to present philosophical issues in a structured and linguistically and rhetorically appropriate way.		
Courses (type, number of weekly contact hours, language — if other than German)		
S (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
term paper (approx. 12 pages)		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor's degree (1 major, 1 minor) Philosophy (2013)		

Application-oriented Subject Physics

(40 ECTS credits)

Application-oriented Subject Physics Compulsory Electives 1: Basics

(16 ECTS credits)

Module title			Abbreviation
Introduction to Physics Part 1 for students of Physics Related Minor Subjects			11-ENNF1-062-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	
1 semester	undergraduate	--	
Contents			
Mechanics, vibration theory, thermodynamics.			
Intended learning outcomes			
The students have basic knowledge of physics for engineering students.			
Courses (type, number of weekly contact hours, language — if other than German)			
V + Ü (no information on SWS (weekly contact hours) and course language available)			
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)			
written examination (approx. 120 minutes)			
Allocation of places			
Only as part of pool of general key skills (ASQ): 20 places. Places will be allocated by lot.			
Additional information			
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Workload			
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Teaching cycle			
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Referred to in LPO I (examination regulations for teaching-degree programmes)			
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Module appears in			
Bachelor' degree (1 major) Mathematics (2008)			
Bachelor' degree (1 major) Mathematics (2014)			
Bachelor' degree (1 major) Mathematics (2012)			
Bachelor' degree (1 major) Mathematics (2013)			
Bachelor' degree (1 major) Mathematics (2007)			
Bachelor' degree (1 major) Technology of Functional Materials (2009)			
Bachelor' degree (1 major) Technology of Functional Materials (2010)			
Bachelor' degree (1 major) Computational Mathematics (2009)			
Bachelor' degree (1 major) Computational Mathematics (2014)			
Bachelor' degree (1 major) Computational Mathematics (2012)			
Bachelor' degree (1 major) Computational Mathematics (2013)			
Bachelor' degree (1 major) Aerospace Computer Science (2009)			
Bachelor' degree (1 major) Aerospace Computer Science (2014)			
Bachelor' degree (1 major) Aerospace Computer Science (2011)			
Bachelor' degree (1 major) Functional Materials (2012)			
Bachelor' degree (1 major) Technology of Functional Materials (2006)			

Module title			Abbreviation
Introduction to Physics Part 2 for students of Physics Related Minor Subjects			11-ENNF2-062-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	
1 semester	undergraduate	--	
Contents			
Science of electricity, magnetism, optics, Atomic Physics.			
Intended learning outcomes			
The students have basic knowledge of physics for engineering students.			
Courses (type, number of weekly contact hours, language — if other than German)			
V + Ü (no information on SWS (weekly contact hours) and course language available)			
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)			
written examination (approx. 120 minutes)			
Allocation of places			
Only as part of pool of general key skills (ASQ): 20 places. Places will be allocated by lot.			
Additional information			
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Workload			
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Teaching cycle			
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Referred to in LPO I (examination regulations for teaching-degree programmes)			
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Module appears in			
Bachelor' degree (1 major) Mathematics (2008) Bachelor' degree (1 major) Mathematics (2014) Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Mathematics (2007) Bachelor' degree (1 major) Technology of Functional Materials (2009) Bachelor' degree (1 major) Technology of Functional Materials (2010) Bachelor' degree (1 major) Computational Mathematics (2009) Bachelor' degree (1 major) Computational Mathematics (2014) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) Bachelor' degree (1 major) Aerospace Computer Science (2009) Bachelor' degree (1 major) Aerospace Computer Science (2014) Bachelor' degree (1 major) Aerospace Computer Science (2011) Bachelor' degree (1 major) Functional Materials (2012) Bachelor' degree (1 major) Technology of Functional Materials (2006)			

Module title		Abbreviation
Classical Physics (Mechanics, Thermodynamics, Waves, Oscillations, Electricity, Magnetism and Optics)		11-KP-092-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)
16	numerical grade	--
Duration	Module level	Other prerequisites
2 semester	undergraduate	Bridge course Mathematische Rechenmethoden der Physik (Mathematical Methods of Physics) for first-semester students.
Contents		
Physical laws of mechanics, thermodynamics, vibrations, waves, science of electricity, magnetism, electromagnetic vibrations and waves, radiation and wave optics. Time, room and motion. Physical values. Force and motion. Interactions and central forces. General relativity. Mechanics of rigid bodies. Friction. Vibration and waves. Non-linearity and chaos. Mechanics of non-rigid bodies. Gasses. Thermodynamics. Electrostatics. Electric current. Mechanisms of conduction. Magnetostatics. Electromagnetic induction. Maxwell equations. Science of alternating current. Electromagnetic waves. Geometric optics. Wave optics.		
Intended learning outcomes		
The students understand the basic principles and connections of mechanics, thermodynamics, vibrations, waves, science of electricity, magnetism, electromagnetic vibrations and waves, radiation and wave optics. They are able to apply mathematical methods to the formulation of physical contexts and autonomously apply their knowledge to the solution of mathematical-physical tasks.		
Courses (type, number of weekly contact hours, language — if other than German)		
Klassische Physik 1 (Mechanik, Wellen, Wärme) (Classical Physics 1 (Mechanics, Waves, Heat)): V (4 weekly contact hours) + Ü (2 weekly contact hours), once a year (winter semester) Klassische Physik 2 (Elektromagnetismus, Optik) (Classical Physics 2 (Electromagnetism, Optics)): V (4 weekly contact hours) + Ü (2 weekly contact hours), once a year (summer semester)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
<p>This module has the following assessment components</p> <ol style="list-style-type: none"> Topics covered in lectures and exercises in part 1 (Klassische Physik 1 (Classical Physics 1)): written examination (approx. 120 minutes). Topics covered in lectures and exercises in part 2 (Klassische Physik 2 (Classical Physics 2)): written examination (approx. 120 minutes). Topics covered in lectures and exercises in parts 1 and 2: oral examination of one candidate each (approx. 30 minutes, usually chosen) or written examination (approx. 120 minutes). <p>Assessment component 3 will be offered in German; English if agreed upon with examiner(s). Successful completion of approx. 50% of practice work each is a prerequisite for admission to assessment components 1 and 2. To qualify for admission to assessment component 3, students must pass assessment component 1 and/or 2. Students are highly recommended to attend both courses Klassische Physik 1 (Classical Physics 1) and Klassische Physik 2 (Classical Physics 2). The topics discussed in these two courses will be covered in assessment component 3. Students must register for assessment components 1 through 3 online (details to be announced). To pass this module, students must first pass assessment component 1 or 2 and must then pass assessment component 3. The grade achieved in assessment component 1 or 2 (whichever is better) and the grade achieved in assessment component 3 will each count 50% towards the overall grade awarded for the module.</p>		
Allocation of places		
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Additional information
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Workload
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Teaching cycle
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Referred to in LPO I (examination regulations for teaching-degree programmes)
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Module appears in
Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Physics (2010) Bachelor' degree (1 major) Physics (2012) Bachelor' degree (1 major) Nanostructure Technology (2010) Bachelor' degree (1 major) Nanostructure Technology (2012) Bachelor' degree (1 major) Mathematical Physics (2009) Bachelor' degree (1 major) Mathematical Physics (2012) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) Bachelor's degree (1 major, 1 minor) Physics (Minor, 2010) No final examination Special study offering (2010)

Application-oriented Subject Physics Compulsory Electives 2: Lab Course

(9 ECTS credits)

Exactly one of the two modules 11-P-PA Physikalisches Praktikum Teil A (Physics Practical Course A) and 11-PNNF Physikalisches Praktikum für Studierende eines physiknahen Nebenfachs (Physics Practical Course for Students of Physics-related Minors) must be taken; students are not permitted to take both of these modules.

Module title		Abbreviation
Physics Laboratory Course for students of Physics Related Minor Subjects		11-PNNF-o62-m01
Module coordinator		Module offered by
Managing Director of the Institute of Applied Physics		Faculty of Physics and Astronomy
ECTS	Method of grading	Only after succ. compl. of module(s)
3	(not) successfully completed	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	--
Contents		
Mechanics, vibration theory, thermodynamics, optics, X-rays, nuclear magnetic resonance, Atomic and Nuclear Physics.		
Intended learning outcomes		
The students know the principles of Physics.		
Courses (type, number of weekly contact hours, language — if other than German)		
P (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
a) oral test (approx. 15 minutes) during experiment and b) ungraded written examination (approx. 90 minutes)		
Allocation of places		
Only as part of pool of general key skills (ASQ): 15 places. Places will be allocated by lot.		
Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Mathematics (2008) Bachelor' degree (1 major) Mathematics (2014) Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Mathematics (2007) Bachelor' degree (1 major) Technology of Functional Materials (2009) Bachelor' degree (1 major) Technology of Functional Materials (2010) Bachelor' degree (1 major) Computational Mathematics (2009) Bachelor' degree (1 major) Computational Mathematics (2014) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) Bachelor' degree (1 major) Functional Materials (2012) Bachelor' degree (1 major) Technology of Functional Materials (2006)		

Module title		Abbreviation
Lab Course A		11-P-PA-112-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)
5	(not) successfully completed	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	--
Contents		
Physical laws of mechanics, thermodynamics, science of electricity, types of error, error approximation and propagation, graphs, linear regression, average values and standard deviation, distribution functions, significance tests, writing of lab reports and publications..		
Intended learning outcomes		
The students know and have mastered physical measuring methods and experimenting techniques. They are able to independently plan and conduct experiments, to cooperate with others, and to document the results in a measuring protocol. They are able to evaluate the measuring results on the basis of error propagation and of the principles of statistics and to draw, present and discuss the conclusions.		
Courses (type, number of weekly contact hours, language — if other than German)		
Auswertung von Messungen und Fehlerrechnung (Measurements and Data Analysis): V (1 weekly contact hour) + Ü (1 weekly contact hour), once a year (winter semester) Beispiele aus Mechanik, Wärmelehre und Elektrik (Examples from Mechanics, Thermodynamics and Electricity, BAM): P (2 weekly contact hours)		
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>This module has the following assessment components</p> <ol style="list-style-type: none"> Topics covered in lectures and exercises: written examination (approx. 120 minutes) Lab course: a) Preparing, performing and evaluating the experiments will be considered successfully completed if a Testat (exam) is passed. b) Talk (with discussion) to test the students' understanding of the physics-related contents of the course (approx. 30 minutes). <p>Successful completion of approx. 50% of practice work is a prerequisite for admission to assessment component 1.</p> <p>To pass assessment component 2, students must pass both elements a) and b). Students will be offered one opportunity to retake element a) and/or element b).</p> <p>Students must register for assessment components 1 and 2 online (details to be announced).</p> <p>Students must attend Auswertung von Messungen und Fehlerrechnung (Measurements and Data Analysis) before attending Beispiele aus Mechanik, Wärmelehre und Elektrik (Examples from Mechanics, Thermodynamics and Electricity).</p> <p>To pass this module, students must pass both assessment component 1 and assessment component 2.</p>		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)

§ 53 (1) 1. a) Physik Mechanik, Wärmelehre, Elektrizitätslehre, Optik, der speziellen Relativitätstheorie
§ 53 (1) 1. c) Physik physikalische Grundpraktika
§ 77 (1) 1. a) Physik "Grundlagen der Experimentalphysik"
§ 77 (1) 1. d) Physik "physikalische Praktika"

Module appears in

Bachelor' degree (1 major) Mathematics (2012)
Bachelor' degree (1 major) Mathematics (2013)
Bachelor' degree (1 major) Physics (2012)
Bachelor' degree (1 major) Nanostructure Technology (2012)
Bachelor' degree (1 major) Mathematical Physics (2012)
Bachelor' degree (1 major) Computational Mathematics (2012)
Bachelor' degree (1 major) Computational Mathematics (2013)
First state examination for the teaching degree Grundschule Physics (2009)
First state examination for the teaching degree Hauptschule Physics (2009)
First state examination for the teaching degree Realschule Physics (2009)
First state examination for the teaching degree Gymnasium Physics (2009)
First state examination for the teaching degree Mittelschule Physics (2013)

Module title		Abbreviation
Basic Practical Course B (Minor Studies)		11-P-NFB-122-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)
4	(not) successfully completed	11-P-PA
Duration	Module level	Other prerequisites
1 semester	undergraduate	--
Contents		
Physical laws of optics, vibrations and waves, science of electricity and circuits with electric components.		
Intended learning outcomes		
The students know and have mastered physical measuring methods and experimenting techniques. They are able to independently plan and conduct experiments, to cooperate with others, and to document the results in a measuring protocol. They are able to evaluate the measuring results on the basis of error propagation and of the principles of statistics and to draw, present and discuss the conclusions.		
Courses (type, number of weekly contact hours, language — if other than German)		
P (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
a) Preparing, performing and evaluating (lab report) the experiments will be considered successfully completed if a Testat (exam) is passed. Experiments that were not successfully completed can be repeated once. And b) talk (with discussion; approx. 30 minutes) to test the candidate's understanding of the physics-related contents of the module component. Talks that were not successfully completed can be repeated once. Both components of the assessment have to be successfully completed.		
Allocation of places		
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Additional information		
Additional information on module duration: 1 to 2 semesters.		
Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Mathematics (2014) Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Computational Mathematics (2014) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013)		

Application-oriented Subject Physics Compulsory Electives 3

(24 ECTS credits)

Out of several module components covering the same contents, students may only use one each. This means that the following combinations are not permitted:

- 11-KM may neither be combined with 11-QAM nor with 11-FKP.
- 11-STE may neither be combined with 11-ST nor with 11-ED.
- 11-TQM may neither be combined with 11-TM nor with 11-QM.

Module title		Abbreviation
Condensed Matter (Quanta, Atoms, Molecules, Solid State Physics)		11-KM-092-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)
16	numerical grade	--
Duration	Module level	Other prerequisites
2 semester	undergraduate	--
Contents		
Quantum phenomena, introduction to Atomic Physics and physical laws of solids. Experimental principles of Quantum Physics. Mathematical formulation of quantum mechanics. Quantum mechanics of hydrogen atoms. Atoms in external fields. Many-electron atoms. Optical transitions and spectroscopy. Laser. Molecules and chemical bonding. Molecule rotations and vibrations. Bonding in crystals. Mechanical properties. Free electron gas (FEG). Crystal structure. The reciprocal lattice. Structure determination. Lattice vibrations (phonons). Thermal properties of insulators. Electrons in a periodic potential.		
Intended learning outcomes		
The students know the basic contexts and principles of quantum phenomena, Atomic Physics and solids (bonding and structure, lattice dynamics, thermal properties, principles of electronic properties (free electron gas)). They are able to apply mathematical methods to the formulation of modern physical contexts and autonomously apply their knowledge to the solution of mathematical-physical tasks.		
Courses (type, number of weekly contact hours, language — if other than German)		
Kondensierte Materie 1 (Quanten, Atome, Moleküle) (Condensed Matter 1 (Quanta, Atoms, Molecules)): V (4 weekly contact hours) + Ü (2 weekly contact hours), once a year (winter semester) Kondensierte Materie 2 (Festkörperphysik 1) (Condensed Matter 2 (Solid State Physics)): V (4 weekly contact hours) + Ü (2 weekly contact hours), once a year (summer semester)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
<p>This module has the following assessment components</p> <ol style="list-style-type: none"> Topics covered in lectures and exercises in part 1 (Kondensierte Materie 1 (Condensed Matter 1)): written examination (approx. 120 minutes). Topics covered in lectures and exercises in part 2 (Kondensierte Materie 2 (Condensed Matter 2)): written examination (approx. 120 minutes). Topics covered in lectures and exercises in parts 1 and 2: oral examination of one candidate each (approx. 30 minutes, usually chosen) or written examination (approx. 120 minutes). <p>Assessment component 3 will be offered in German; English if agreed upon with examiner(s). Successful completion of approx. 50% of practice work each is a prerequisite for admission to assessment components 1 and 2. To qualify for admission to assessment component 3, students must pass assessment component 1 and/or 2. Students are highly recommended to attend both courses Kondensierte Materie 1 (Condensed Matter 1) and Kondensierte Materie 2 (Condensed Matter 2). The topics discussed in these two courses will be covered in assessment component 3. Students must register for assessment components 1 through 3 online (details to be announced). To pass this module, students must first pass assessment component 1 or 2 and must then pass assessment component 3. The grade achieved in assessment component 1 or 2 (whichever is better) and the grade achieved in assessment component 3 will each count 50% towards the overall grade awarded for the module.</p>		
Allocation of places		
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Additional information
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Workload
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Teaching cycle
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Referred to in LPO I (examination regulations for teaching-degree programmes)
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Module appears in
Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Physics (2010) Bachelor' degree (1 major) Physics (2012) Bachelor' degree (1 major) Nanostructure Technology (2010) Bachelor' degree (1 major) Nanostructure Technology (2012) Bachelor' degree (1 major) Mathematical Physics (2009) Bachelor' degree (1 major) Mathematical Physics (2012) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) Bachelor's degree (1 major, 1 minor) Physics (Minor, 2010)

Module title			Abbreviation
Statistical Mechanics, Thermodynamics and Electrodynamics			11-STE-092-m01
Module coordinator		Module offered by	
Managing Director of the Institute of Theoretical Physics and Astrophysics		Faculty of Physics and Astronomy	
ECTS	Method of grading	Only after succ. compl. of module(s)	
16	numerical grade	--	
Duration	Module level	Other prerequisites	
2 semester	undergraduate	10-M1-PHY and 10-M2-PHY or 10-M1-NST and 10-M2-NST	
Contents			
Principles of Statistical Physics: Ideal systems. Thermodynamics: Quantum statistics, systems of interacting particles, critical phenomena, Maxwell equations, electrostatics, magnetostatics, Maxwell equations in matter, dynamics of electromagnetic fields. Special relativity.			
Intended learning outcomes			
The students have advanced knowledge of the methods of Theoretical Physics. They know the principles of electrodynamics, thermodynamics and statistical mechanics. They are familiar with the corresponding calculation methods and are able to independently apply them to the description and solution of problems in this area.			
Courses (type, number of weekly contact hours, language — if other than German)			
Statistische Mechanik und Thermodynamik (Statistical Mechanics and Thermodynamics): V (4 weekly contact hours) + Ü (2 weekly contact hours), once a year (winter semester) Theoretische Elektrodynamik (Theoretical Electrodynamics): V (4 weekly contact hours) + Ü (2 weekly contact hours), once a year (summer semester)			
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)			
This module has the following assessment components 1. Topics covered in lectures and exercises in part 1 (Statistische Mechanik und Thermodynamik (Statistical Mechanics and Thermodynamics)): written examination (approx. 120 minutes). 2. Topics covered in lectures and exercises in part 2 (Theoretische Elektrodynamik (Theoretical Electrodynamics)): written examination (approx. 120 minutes). 3. Topics covered in lectures and exercises in parts 1 and 2: oral examination of one candidate each (approx. 30 minutes, usually chosen) or written examination (approx. 120 minutes). Assessment component 3 will be offered in German; English if agreed upon with examiner(s). Successful completion of approx. 50% of practice work each is a prerequisite for admission to assessment components 1 and 2. Students are highly recommended to attend both courses Statistische Mechanik und Thermodynamik (Statistical Mechanics and Thermodynamics) and Theoretische Elektrodynamik (Theoretical Electrodynamics). The topics discussed in these two courses will be covered in assessment component 3. Students must register for assessment components 1 through 3 online (details to be announced). To pass this module, students must first pass assessment component 1 or 2 and must then pass assessment component 3. The grade achieved in assessment component 1 or 2 (whichever is better) and the grade achieved in assessment component 3 will each count 50% towards the overall grade awarded for the module.			
Allocation of places			
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Additional information			
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Workload			
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Teaching cycle
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Referred to in LPO I (examination regulations for teaching-degree programmes)
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Module appears in
<p>Bachelor' degree (1 major) Mathematics (2012)</p> <p>Bachelor' degree (1 major) Mathematics (2013)</p> <p>Bachelor' degree (1 major) Physics (2010)</p> <p>Bachelor' degree (1 major) Physics (2012)</p> <p>Bachelor' degree (1 major) Nanostructure Technology (2010)</p> <p>Bachelor' degree (1 major) Mathematical Physics (2009)</p> <p>Bachelor' degree (1 major) Mathematical Physics (2012)</p> <p>Bachelor' degree (1 major) Computational Mathematics (2012)</p> <p>Bachelor' degree (1 major) Computational Mathematics (2013)</p> <p>Bachelor's degree (1 major, 1 minor) Physics (Minor, 2010)</p>

Module title		Abbreviation
Theoretical Mechanics and Quantum Mechanics		11-TQM-092-m01
Module coordinator		Module offered by
Managing Director of the Institute of Theoretical Physics and Astrophysics		Faculty of Physics and Astronomy
ECTS	Method of grading	Only after succ. compl. of module(s)
16	numerical grade	--
Duration	Module level	Other prerequisites
2 semester	undergraduate	10-M1-PHY, 10-M2-PHY and 11-MPI-3 or 10-M1-NST, 10-M2-NST and MPI-3
Contents		
<p>Newtonian mechanics. Lagrangian and Hamiltonian formalism. Symmetries and conservation laws. Applications: Problems of central forces, minor vibrations, rigid body, motion in electromagnetic fields. Relativistic dynamics. Limits of classical physics. Schrödinger equation, mathematical principles of quantum mechanics, harmonic oscillator. Angular momentum and spin. Hydrogen atom. Methods of approximation. Motion in electric fields. Many-particle systems.</p>		
Intended learning outcomes		
<p>The students have gained first experiences concerning the working methods of Theoretical Physics. They are familiar with the principles of theoretical mechanics and their different formulations and understand the principles of quantum theory. They are able to apply the acquired calculation methods and techniques to simple problems of Theoretical Physics and to interpret the results. They have especially acquired knowledge of basic mathematical concepts.</p>		
Courses (type, number of weekly contact hours, language — if other than German)		
<p>Theoretische Mechanik (Theoretical Mechanics): V (4 weekly contact hours) + Ü (2 weekly contact hours), once a year (winter semester) Quantenmechanik (Quantum Mechanics): V (4 weekly contact hours) + Ü (2 weekly contact hours), once a year (summer semester)</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>This module has the following assessment components</p> <ol style="list-style-type: none"> Topics covered in lectures and exercises in part 1 (Theoretische Mechanik (Theoretical Mechanics)): written examination (approx. 120 minutes). Topics covered in lectures and exercises in part 2 (Quantenmechanik (Quantum Mechanics)): written examination (approx. 120 minutes). Topics covered in lectures and exercises in parts 1 and 2: oral examination of one candidate each (approx. 30 minutes, usually chosen) or written examination (approx. 120 minutes). <p>Successful completion of approx. 50% of practice work each is a prerequisite for admission to assessment components 1 and 2. To qualify for admission to assessment component 3, students must pass assessment component 1 and/or 2. Students are highly recommended to attend both courses Theoretische Mechanik (Theoretical Mechanics) and Quantenmechanik (Quantum Mechanics). The topics discussed in these two courses will be covered in assessment component 3. Students must register for assessment components 1 through 3 online (details to be announced). To pass this module, students must first pass assessment component 1 or 2 and must then pass assessment component 3. The grade achieved in assessment component 1 or 2 (whichever is better) and the grade achieved in assessment component 3 will each count 50% towards the overall grade awarded for the module.</p>		
Allocation of places		
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Additional information
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Workload
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Teaching cycle
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Referred to in LPO I (examination regulations for teaching-degree programmes)
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Module appears in
Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Physics (2010) Bachelor' degree (1 major) Physics (2012) Bachelor' degree (1 major) Mathematical Physics (2009) Bachelor' degree (1 major) Mathematical Physics (2012) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) Bachelor's degree (1 major, 1 minor) Physics (Minor, 2010)

Module title		Abbreviation
Theoretical Electrodynamics		11-ED-092-m01
Module coordinator		Module offered by
Managing Director of the Institute of Theoretical Physics and Astrophysics		Faculty of Physics and Astronomy
ECTS	Method of grading	Only after succ. compl. of module(s)
8	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew.
Contents		
Principles of electrostatics, magnetostatics, Maxwell equations, covariant formulation, electrodynamics and matter		
Intended learning outcomes		
The students have knowledge of the principles of classical electrodynamics and the required calculation methods.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 120 minutes, for modules with less than 4 ECTS credits approx. 90 minutes; unless otherwise specified) Assessment offered: When and how often assessment will be offered depends on the method of assessment and will be announced in due form under observance of Section 32 Subsection 3 ASPO (general academic and examination regulations) 2009.		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Nanostructure Technology (2012)		
Bachelor's with 1 major Mathematics (2012)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Mathematik - 2012	page 190 / 237

Bachelor' degree (1 major) Computational Mathematics (2012)
Bachelor' degree (1 major) Computational Mathematics (2013)
Bachelor's degree (1 major, 1 minor) Physics (Minor, 2010)

Module title		Abbreviation
Solid State Physics 1		11-FKP-092-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)
8	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew.
Contents		
Physical laws of solids: Bonding and structure, lattice dynamics, thermal properties, principles of electronic properties (free electron gas).		
Intended learning outcomes		
The students understand the basic contexts and principles of solids (bonding and structure, lattice dynamics, thermal properties, principles of electronic properties (free electron gas)).		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 120 minutes, for modules with less than 4 ECTS credits approx. 90 minutes; unless otherwise specified) Assessment offered: When and how often assessment will be offered depends on the method of assessment and will be announced in due form under observance of Section 32 Subsection 3 ASPO (general academic and examination regulations) 2009.		
Allocation of places		
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Additional information		
--		
Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Mathematical Physics (2009) Bachelor' degree (1 major) Mathematical Physics (2012)		
Bachelor's with 1 major Mathematics (2012)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Mathematik - 2012	page 192 / 237

Bachelor' degree (1 major) Computational Mathematics (2012)
Bachelor' degree (1 major) Computational Mathematics (2013)
Bachelor's degree (1 major, 1 minor) Physics (Minor, 2010)

Module title		Abbreviation
Theoretical Mechanics		11-TM-092-m01
Module coordinator		Module offered by
Managing Director of the Institute of Theoretical Physics and Astrophysics		Faculty of Physics and Astronomy
ECTS	Method of grading	Only after succ. compl. of module(s)
8	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew.
Contents		
Newtonian mechanics, Lagrangian and Hamiltonian formalism, conservation laws, limits of classical physics.		
Intended learning outcomes		
The students have knowledge of the principles of classical theoretical mechanics and the required calculation methods.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 120 minutes, for modules with less than 4 ECTS credits approx. 90 minutes; unless otherwise specified) Assessment offered: When and how often assessment will be offered depends on the method of assessment and will be announced in due form under observance of Section 32 Subsection 3 ASPO (general academic and examination regulations) 2009.		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
--		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Nanostructure Technology (2012) Bachelor' degree (1 major) Computational Mathematics (2012)		
Bachelor's with 1 major Mathematics (2012)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Mathematik - 2012	page 194 / 237

Bachelor' degree (1 major) Computational Mathematics (2013)
Bachelor's degree (1 major, 1 minor) Physics (Minor, 2010)

Module title		Abbreviation
Quanta, Atoms, Molecules		11-QAM-092-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)
8	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew.
Contents		
Physical laws of Atomic, Quantum and Molecular Physics.		
Intended learning outcomes		
The students have knowledge of the basic contexts and principles of Atomic and Molecular Physics (atoms: Quantum mechanical atom model, one/multi-electron atoms, electronic dipole transitions, atoms in B field, as well as molecules: Bonding models and elementary excitations: rotations, vibrations, electronic excitations)		
Courses (type, number of weekly contact hours, language — if other than German)		
Ü + Ü (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 120 minutes, for modules with less than 4 ECTS credits approx. 90 minutes; unless otherwise specified) Assessment offered: When and how often assessment will be offered depends on the method of assessment and will be announced in due form under observance of Section 32 Subsection 3 ASPO (general academic and examination regulations) 2009.		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Mathematical Physics (2009) Bachelor' degree (1 major) Mathematical Physics (2012)		
Bachelor's with 1 major Mathematics (2012)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Mathematik - 2012	page 196 / 237

Bachelor' degree (1 major) Computational Mathematics (2012)
Bachelor' degree (1 major) Computational Mathematics (2013)
Bachelor's degree (1 major, 1 minor) Physics (Minor, 2010)

Module title		Abbreviation
Quantum Mechanics		11-QM-092-m01
Module coordinator		Module offered by
Managing Director of the Institute of Theoretical Physics and Astrophysics		Faculty of Physics and Astronomy
ECTS	Method of grading	Only after succ. compl. of module(s)
8	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew.
Contents		
Limits of classical physics, Schrödinger equation, mathematical foundations of quantum mechanics, harmonic oscillator, angular momentum and spin, hydrogen atom, many-particle systems		
Intended learning outcomes		
The students have knowledge of the principles of quantum mechanics and the required calculation methods.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 120 minutes, for modules with less than 4 ECTS credits approx. 90 minutes; unless otherwise specified) Assessment offered: When and how often assessment will be offered depends on the method of assessment and will be announced in due form under observance of Section 32 Subsection 3 ASPO (general academic and examination regulations) 2009.		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013)		
Bachelor's with 1 major Mathematics (2012)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Mathematik - 2012	page 198 / 237

Bachelor's degree (1 major, 1 minor) Physics (Minor, 2010)

Module title		Abbreviation
Statistical Mechanics and Thermodynamics		11-ST-092-m01
Module coordinator		Module offered by
Managing Director of the Institute of Theoretical Physics and Astrophysics		Faculty of Physics and Astronomy
ECTS	Method of grading	Only after succ. compl. of module(s)
8	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew.
Contents		
Principles of thermodynamics, fundamental theorems, thermodynamic potentials, principles of statistical mechanics.		
Intended learning outcomes		
The students have knowledge of the principles of thermodynamics and statistical mechanics and the required calculation methods.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 120 minutes, for modules with less than 4 ECTS credits approx. 90 minutes; unless otherwise specified) Assessment offered: When and how often assessment will be offered depends on the method of assessment and will be announced in due form under observance of Section 32 Subsection 3 ASPO (general academic and examination regulations) 2009.		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Computational Mathematics (2012)		
Bachelor's with 1 major Mathematics (2012)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Mathematik - 2012	page 200 / 237

Bachelor' degree (1 major) Computational Mathematics (2013)
Bachelor's degree (1 major, 1 minor) Physics (Minor, 2010)

Module title		Abbreviation
Nuclear and Elementary Particle Physics		11-KET-122-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)
6	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew.
Contents		
Physical laws of Nuclear and Elementary Particle Physics. Historical introduction. Methods of Nuclear Physics. Nuclear models. Structure of nuclei. Radioactivity and spectroscopy. Nuclear energy. Radiation and matter. Accelerators and detectors. Electromagnetic interaction. Strong interaction. Weak interaction. Standard model.		
Intended learning outcomes		
The students understand the basic connections between fundamental Nuclear and Elementary Particle Physics. They have an overview of the experimental observations of Particle Physics and the theoretical models which describe them.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 120 minutes)		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Physics (2012) Bachelor' degree (1 major) Mathematical Physics (2012) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013)		
Bachelor's with 1 major Mathematics (2012)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Mathematik - 2012	page 202 / 237

Application-oriented Subject Business Management and Economics (40 ECTS credits)

Application-oriented Subject Business Management and Economics Compulsory Courses

(30 ECTS credits)

Module title		Abbreviation
Managerial Accounting		12-IntUR-G-o82-mo1
Module coordinator		Module offered by
holder of the Chair of Business Management and Accounting		Faculty of Business Management and Economics
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	--
Contents		
<p>Content: This course offers an introduction to aims and methods of managerial accounting (cost accounting).</p> <p>Outline of syllabus:</p> <ol style="list-style-type: none"> 1. Managerial accounting and financial accounting 2. Managerial accounting: basic terms 3. Different types of costs 4. Cost centre accounting based on total costs 5. Job costing based on total costs 6. Cost centre accounting and job costing based on direct/variable costs 7. Budgeting and cost-variance analysis 8. Cost-volume-profit analysis 9. Cost information and operating decisions <p>Reading: Coenenberg/Fischer/Günther: Kostenrechnung und Kostenanalyse, Stuttgart. Friedl/Hofmann/Pedell: Kostenrechnung. Eine entscheidungsorientierte Einführung. (most recent editions)</p>		
Intended learning outcomes		
<p>After completing the course "Management Accounting and Control", the students will be able to</p> <ul style="list-style-type: none"> (i) set out the responsibilities of the company's internal accounting and control; (ii) define the central concepts of internal enterprise computing restriction and control and assign case studies the terms; (iii) apply the basic methods of internal corporate accounting and control on a full and cost base to idealized case studies of medium difficulty that calculate relevant costs and benefits and take on this basis a reasoned decision. 		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 60 minutes)		
Allocation of places		
<p>Number of places: 640. No restrictions with regard to available places for Bachelor's students of Wirtschaftswissenschaft (Business Management and Economics), Wirtschaftsmathematik (Mathematics for Economics) and Wirtschaftsinformatik (Business Information Systems). The remaining places will be allocated to students of other subjects. Should the number of applications exceed the number of available places, places will be allocated in a standardised procedure among all applicants irrespective of their subjects according to the following quotas: Quota 1 (50% of places): total number of ECTS credits already achieved in the respective degree subject; among applicants with the same number of ECTS credits achieved, places will be allocated by lot. Quota 2 (25% of places): number of subject semesters of the respective applicant; among applicants with the same number of</p>		

subject semesters, places will be allocated by lot. Quota 3 (25% of places): allocation by lot. Applicants who already have successfully completed at least one module component of the respective module will be given preferential consideration. Places on all courses of the module component with a restricted number of places will be allocated in the same procedure. A waiting list will be maintained and places re-allocated as they become available.

Additional information

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Workload

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Teaching cycle

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

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Module appears in

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

Module title		Abbreviation
Financial Accounting		12-ExtUR-G-o82-m01
Module coordinator		Module offered by
holder of the Chair of Business Management and Business Taxation		Faculty of Business Management and Economics
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	--
Contents		
This course offers an introduction to the fundamentals of financial accounting, including the technique of double-entry book-keeping as well as the fundamentals of recognition, valuation and presentation of assets, liabilities and equity according to German commercial law.		
Intended learning outcomes		
Students acquire a basic understanding of the fundamentals of financial accounting. They are able to arrange, reproduce and apply this knowledge, i.e. they are able to solve simple accounting problems.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 60 minutes)		
Allocation of places		
Number of places: 640. No restrictions with regard to available places for Bachelor's students of Wirtschaftswissenschaft (Business Management and Economics), Wirtschaftsmathematik (Mathematics for Economics) and Wirtschaftsinformatik (Business Information Systems). The remaining places will be allocated to students of other subjects. Should the number of applications exceed the number of available places, places will be allocated in a standardised procedure among all applicants irrespective of their subjects according to the following quotas: Quota 1 (50% of places): total number of ECTS credits already achieved in the respective degree subject; among applicants with the same number of ECTS credits achieved, places will be allocated by lot. Quota 2 (25% of places): number of subject semesters of the respective applicant; among applicants with the same number of subject semesters, places will be allocated by lot. Quota 3 (25% of places): allocation by lot. Applicants who already have successfully completed at least one module component of the respective module will be given preferential consideration. Places on all courses of the module component with a restricted number of places will be allocated in the same procedure. A waiting list will be maintained and places re-allocated as they become available.		
Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013)		
Bachelor's with 1 major Mathematics (2012)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Mathematik - 2012	page 207 / 237

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

Module title		Abbreviation
Introduction to Business Administration		12-EBWL-G-o82-m01
Module coordinator		Module offered by
holder of the Chair for Human Resource Management and Organisation		Faculty of Business Management and Economics
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	--
Contents		
<p>This course will introduce students to relevant subject areas of business administration. Students will acquire an overview of the different perspectives and main points of view from which a theoretical examination of business enterprise may take place. The course will focus on what companies or other organisations are, how they behave and in what form they are organised. For this purpose, a study will be made of the economic subject's decision-making behaviour.</p> <p>Reading list to be provided during lecture.</p>		
Intended learning outcomes		
The aim of the lectures is to familiarise the students with the basic problem issues and perspectives within the field of business administration.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 60 minutes)		
Allocation of places		
<p>Number of places: 640. No restrictions with regard to available places for Bachelor's students of Wirtschaftswissenschaft (Business Management and Economics), Wirtschaftsmathematik (Mathematics for Economics) and Wirtschaftsinformatik (Business Information Systems). The remaining places will be allocated to students of other subjects. Should the number of applications exceed the number of available places, places will be allocated in a standardised procedure among all applicants irrespective of their subjects according to the following quotas: Quota 1 (50% of places): total number of ECTS credits already achieved in the respective degree subject; among applicants with the same number of ECTS credits achieved, places will be allocated by lot. Quota 2 (25% of places): number of subject semesters of the respective applicant; among applicants with the same number of subject semesters, places will be allocated by lot. Quota 3 (25% of places): allocation by lot. Applicants who already have successfully completed at least one module component of the respective module will be given preferential consideration. Places on all courses of the module component with a restricted number of places will be allocated in the same procedure. A waiting list will be maintained and places re-allocated as they become available.</p>		
Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		

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

Module title		Abbreviation
Introduction to Economics		12-EVWL-G-082-m01
Module coordinator		Module offered by
holder of the Chair of Monetary Policy and International Economics		Faculty of Business Management and Economics
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	--
Contents		
<p>The course deals with the following topics:</p> <ol style="list-style-type: none"> 1. Economics shows how markets function 2. The division of labour is the basis of our wealth 3. The market in action 4. Monopolies and cartels endanger market economies 5. The labour market and the role of unions 6. The government's role in a social market economy 7. Governmental redistribution guarantees the social balance in a market economy 8. Environmental policy and the government's allocation function 9. Objectives and agents in the macro economy 10. How do aggregate supply and demand come into equilibrium? 11. The role of fiscal policy 12. How does a central bank stabilise aggregate demand by setting interest rates? 		
Intended learning outcomes		
By completing this course, students receive a fundamental understanding of economics. Students are able to grasp microeconomic as well as macroeconomic subjects and to analyze them in theoretical models.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 60 minutes)		
Allocation of places		
<p>Number of places: 640. No restrictions with regard to available places for Bachelor's students of Wirtschaftswissenschaft (Business Management and Economics), Wirtschaftsmathematik (Mathematics for Economics) and Wirtschaftsinformatik (Business Information Systems). The remaining places will be allocated to students of other subjects. Should the number of applications exceed the number of available places, places will be allocated in a standardised procedure among all applicants irrespective of their subjects according to the following quotas: Quota 1 (50% of places): total number of ECTS credits already achieved in the respective degree subject; among applicants with the same number of ECTS credits achieved, places will be allocated by lot. Quota 2 (25% of places): number of subject semesters of the respective applicant; among applicants with the same number of subject semesters, places will be allocated by lot. Quota 3 (25% of places): allocation by lot. Applicants who already have successfully completed at least one module component of the respective module will be given preferential consideration. Places on all courses of the module component with a restricted number of places will be allocated in the same procedure. A waiting list will be maintained and places re-allocated as they become available.</p>		
Additional information		
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Workload		
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Bachelor's with 1 major Mathematics (2012)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Mathematik - 2012	page 211 / 237

Teaching cycle

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

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Module appears in

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

Module title		Abbreviation
Macroeconomics 1		12-Mak1-G-o82-mo1
Module coordinator		Module offered by
holder of the Chair of International Economics		Faculty of Business Management and Economics
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	--
Contents		
<p>Description:</p> <p>This module covers basic macroeconomic relationships, the declaration of employment, production, interest, current and capital account, nominal and real exchange rate, prices and inflation - in the long run (with flexible wages and prices) and in the short term (with fixed wages and prices). The course will familiarise students with concepts which are of central importance in a globalised environment (e. g. interest rate arbitrage, foreign exchange risk, purchasing power parity). The explanations will be applied to current issues (e. g. current account balances in the global economy; questions related to the European monetary union and the global financial crisis).</p> <p>Outline of syllabus:</p> <ol style="list-style-type: none"> 1. Macroeconomic issues and characteristics <ul style="list-style-type: none"> - Issues of macroeconomics - The measurement of economic activity 2. Long-term relationships <ul style="list-style-type: none"> - The classic long-term model of the closed economy - Money and Inflation - The classic long-term model of a small open economy - Unemployment 3. Short and medium-term relationships <ul style="list-style-type: none"> - Fluctuations of economic activity: an introduction - The IS-LM model of a closed economy - The IS-LM model of an open economy - Aggregate supply and Phillips curve - Conclusion and outlook <p>Reading:</p> <p>The latest editions of the following textbooks:</p> <p>N. Gregory Mankiw: Macroeconomics [students are recommended to read the original English edition; they may also read the German translation]</p> <p>Olivier Blanchard and David H. Johnson, Macroeconomics Prentice Hall; [a German-language edition of the book by Oliver Blanchard and Gerhard Illing is available from Pearson Studium].</p> <p>Michael Burda and Charles Wyplosz: Macroeconomics. A European text.</p> <p>To illustrate the lecture, case studies in particular will be developed in which more current sources are used.</p>		
Intended learning outcomes		
<p>This expertise enables the students to penetrate economically-intuitively and analytically macroeconomic interactions and problems in the course of advancing globalization and to deal with these arguments. Students learn to interpret on a scientific basis the impact of macroeconomic developments in individual economic actors (businesses, households, the state).</p>		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		

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

written examination (approx. 60 minutes)

Allocation of places

Number of places: 640. No restrictions with regard to available places for Bachelor's students of Wirtschaftswissenschaft (Business Management and Economics), Wirtschaftsmathematik (Mathematics for Economics) and Wirtschaftsinformatik (Business Information Systems). The remaining places will be allocated to students of other subjects. Should the number of applications exceed the number of available places, places will be allocated in a standardised procedure among all applicants irrespective of their subjects according to the following quotas: Quota 1 (50% of places): total number of ECTS credits already achieved in the respective degree subject; among applicants with the same number of ECTS credits achieved, places will be allocated by lot. Quota 2 (25% of places): number of subject semesters of the respective applicant; among applicants with the same number of subject semesters, places will be allocated by lot. Quota 3 (25% of places): allocation by lot. Applicants who already have successfully completed at least one module component of the respective module will be given preferential consideration. Places on all courses of the module component with a restricted number of places will be allocated in the same procedure. A waiting list will be maintained and places re-allocated as they become available.

Additional information

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Workload

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Teaching cycle

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

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Module appears in

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

Module title		Abbreviation
Microeconomics 1		12-Mik1-G-o82-mo1
Module coordinator		Module offered by
holder of the Chair for Economics, Contract Theory and Information Economics		Faculty of Business Management and Economics
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	--
Contents		
<p>The lecture covers the following topics</p> <p>Theory of the household:</p> <ol style="list-style-type: none"> 1. Utility maximisation under constraints 2. Comparative statics 3. Income and substitution effects 4. Labour supply 5. Intertemporal consumption / savings decisions <p>Theory of the firm:</p> <ol style="list-style-type: none"> 6. Production functions (technology) 7. Profit maximisation 8. Long run versus short run cost minimisation 9. Supply of goods 		
Intended learning outcomes		
Students are systematically trained in microeconomic methods relevant in household and firm theory. Accordingly, they will know how to solve optimization problems under constraints. These scientific methods will serve as useful in many fields of specialization in economics and business administration. In particular, students know analytically how to analyze the impact of changes in the economic environment, e.g., wages, interest rates, income on individual decision making.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 60 minutes)		
Allocation of places		
Number of places: 640. No restrictions with regard to available places for Bachelor's students of Wirtschaftswissenschaft (Business Management and Economics), Wirtschaftsmathematik (Mathematics for Economics) and Wirtschaftsinformatik (Business Information Systems). The remaining places will be allocated to students of other subjects. Should the number of applications exceed the number of available places, places will be allocated in a standardised procedure among all applicants irrespective of their subjects according to the following quotas: Quota 1 (50% of places): total number of ECTS credits already achieved in the respective degree subject; among applicants with the same number of ECTS credits achieved, places will be allocated by lot. Quota 2 (25% of places): number of subject semesters of the respective applicant; among applicants with the same number of subject semesters, places will be allocated by lot. Quota 3 (25% of places): allocation by lot. Applicants who already have successfully completed at least one module component of the respective module will be given preference.		
Bachelor's with 1 major Mathematics (2012)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Mathematik - 2012	page 215 / 237

rential consideration. Places on all courses of the module component with a restricted number of places will be allocated in the same procedure. A waiting list will be maintained and places re-allocated as they become available.

Additional information

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Workload

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Teaching cycle

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

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Module appears in

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

Application-oriented Subject Business Management and Economics

Compulsory Electives

(ECTS credits)

Module title			Abbreviation
Introduction to Market-Oriented Management			12-Mark-G-o82-mo1
Module coordinator		Module offered by	
holder of the Chair of Business Administration and Marketing		Faculty of Business Management and Economics	
ECTS	Method of grading	Only after succ. compl. of module(s)	
5	numerical grade	--	
Duration	Module level	Other prerequisites	
1 semester	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">1. Marketing, entrepreneurship and business management2. Explanations of consumer behaviour3. Fundamentals of market research4. Strategic marketing; marketing tools5. Corporate social responsibility versus creating shared value <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 + Ü (no information on SWS (weekly contact hours) and course language available)			

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

written examination (approx. 60 minutes)

Allocation of places

Number of places: 405. No restrictions with regard to available places for Bachelor's students of Wirtschaftswissenschaft (Business Management and Economics), Wirtschaftsmathematik (Mathematics for Economics) and Wirtschaftsinformatik (Business Information Systems). The remaining places will be allocated to students of other subjects. Should the number of applications exceed the number of available places, places will be allocated in a standardised procedure among all applicants irrespective of their subjects according to the following quotas: Quota 1 (50% of places): total number of ECTS credits already achieved in the respective degree subject; among applicants with the same number of ECTS credits achieved, places will be allocated by lot. Quota 2 (25% of places): number of subject semesters of the respective applicant; among applicants with the same number of subject semesters, places will be allocated by lot. Quota 3 (25% of places): allocation by lot. Applicants who already have successfully completed at least one module component of the respective module will be given preferential consideration. Places on all courses of the module component with a restricted number of places will be allocated in the same procedure. A waiting list will be maintained and places re-allocated as they become available.

Additional information

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Workload

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Teaching cycle

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

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Module appears in

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

Module title			Abbreviation
Supply, Production and Operations Management. An Introduction			12-BPL-G-o82-m01
Module coordinator		Module offered by	
holder of the Chair of Business Management and Industrial Management		Faculty of Business Management and Economics	
ECTS	Method of grading	Only after succ. compl. of module(s)	
5	numerical grade	--	
Duration	Module level	Other prerequisites	
1 semester	undergraduate	--	
Contents			
This course will provide students with an overview of fundamental processes in procurement, production and logistics and the related corporate functions as well as a model-based introduction to related planning procedures.			
Intended learning outcomes			
The students will be able to describe and discuss the objectives and major processes in the domains of corporate procurement, production and logistics as well as their interdependencies. Furthermore, they are capable of developing and applying basic planning models in these fields.			
Courses (type, number of weekly contact hours, language — if other than German)			
V + Ü (no information on SWS (weekly contact hours) and course language available)			
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)			
written examination (approx. 60 minutes)			
Allocation of places			
Number of places: 405. No restrictions with regard to available places for Bachelor's students of Wirtschaftswissenschaft (Business Management and Economics), Wirtschaftsmathematik (Mathematics for Economics) and Wirtschaftsinformatik (Business Information Systems). The remaining places will be allocated to students of other subjects. Should the number of applications exceed the number of available places, places will be allocated in a standardised procedure among all applicants irrespective of their subjects according to the following quotas: Quota 1 (50% of places): total number of ECTS credits already achieved in the respective degree subject; among applicants with the same number of ECTS credits achieved, places will be allocated by lot. Quota 2 (25% of places): number of subject semesters of the respective applicant; among applicants with the same number of subject semesters, places will be allocated by lot. Quota 3 (25% of places): allocation by lot. Applicants who already have successfully completed at least one module component of the respective module will be given preferential consideration. Places on all courses of the module component with a restricted number of places will be allocated in the same procedure. A waiting list will be maintained and places re-allocated as they become available.			
Additional information			
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Workload			
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Teaching cycle			
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Referred to in LPO I (examination regulations for teaching-degree programmes)			
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Module appears in			
Bachelor' degree (1 major) Computer Science (2010)			
Bachelor' degree (1 major) Mathematics (2012)			
Bachelor's with 1 major Mathematics (2012)		JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Mathematik - 2012	page 220 / 237

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

Module title			Abbreviation
Investment and Finance. An Introduction			12-I&F-G-o82-mo1
Module coordinator		Module offered by	
holder of the Chair of Business Management, Banking and Finance		Faculty of Business Management and Economics	
ECTS	Method of grading	Only after succ. compl. of module(s)	
5	numerical grade	--	
Duration	Module level	Other prerequisites	
1 semester	undergraduate	--	
Contents			
Content: This course offers an introduction to principles of financial mathematics, several methods of capital budgeting and principles of financial economics.			
Outline of syllabus: 1. Principles of financial mathematics 2. Fundamental concepts 3. Problems of investment and finance in one commodity world under certainty 4. Problems of investment and finance in one commodity world under uncertainty 5. Problems of investment and finance in many commodities world under uncertainty 6. Capital market and corporate financing in Germany			
Intended learning outcomes			
After completing the course "Principles of Investments and Finance", the students will be able (i) to understand the fundamentals in financial mathematics and solve several problems, e.g. via the PV approach; (ii) to address the central problems in intertemporal allocation given different capital market scenarios; (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.			
Courses (type, number of weekly contact hours, language — if other than German)			
V + Ü (no information on SWS (weekly contact hours) and course language available)			
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)			
written examination (approx. 60 minutes)			
Allocation of places			
Number of places: 405. No restrictions with regard to available places for Bachelor's students of Wirtschaftswissenschaft (Business Management and Economics), Wirtschaftsmathematik (Mathematics for Economics) and Wirtschaftsinformatik (Business Information Systems). The remaining places will be allocated to students of other subjects. Should the number of applications exceed the number of available places, places will be allocated in a standardised procedure among all applicants irrespective of their subjects according to the following quotas: Quota 1 (50% of places): total number of ECTS credits already achieved in the respective degree subject; among applicants with the same number of ECTS credits achieved, places will be allocated by lot. Quota 2 (25% of places): number of subject semesters of the respective applicant; among applicants with the same number of subject semesters, places will be allocated by lot. Quota 3 (25% of places): allocation by lot. Applicants who already have successfully completed at least one module component of the respective module will be given preferential consideration. Places on all courses of the module component with a restricted number of places will be allocated in the same procedure. A waiting list will be maintained and places re-allocated as they become available.			
Additional information			
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Bachelor's with 1 major Mathematics (2012)		JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (18o ECTS) Mathematik - 2012	page 222 / 237

Workload
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Teaching cycle
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Referred to in LPO I (examination regulations for teaching-degree programmes)
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Module appears in
<p>Bachelor' degree (1 major) Computer Science (2010)</p> <p>Bachelor' degree (1 major) Mathematics (2012)</p> <p>Bachelor' degree (1 major) Mathematics (2013)</p> <p>Bachelor' degree (1 major) Business Management and Economics (2009)</p> <p>Bachelor' degree (1 major) Business Management and Economics (2008)</p> <p>Bachelor' degree (1 major) Business Management and Economics (2010)</p> <p>Bachelor' degree (1 major) Economathematics (2009)</p> <p>Bachelor' degree (1 major) Economathematics (2012)</p> <p>Bachelor' degree (1 major) Economathematics (2008)</p> <p>Bachelor' degree (1 major) Business Information Systems (2009)</p> <p>Bachelor' degree (1 major) Business Information Systems (2008)</p> <p>Master's degree (1 major) China Business and Economics (2014)</p> <p>Master's degree (1 major) China Business and Economics (2012)</p> <p>Bachelor's degree (1 major, 1 minor) Business Management and Economics (Minor, 2010)</p>

Module title		Abbreviation
Macroeconomics 2		12-Mak2-G-o82-m01
Module coordinator		Module offered by
holder of the Chair of Public Finance		Faculty of Business Management and Economics
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	--
Contents		
<p>Description:</p> <p>The lecture provides an introduction to long run or dynamic issues of macroeconomic theory and policy.</p> <p>Contents:</p> <ol style="list-style-type: none"> 1. Phillips curve and dynamic model 2. Growth theory and policy 3. Microeconomic foundations of macroeconomics 4. Macroeconomic policy <p>Lecture notes to be provided by Chair.</p>		
Intended learning outcomes		
After completing the course "Makroökonomie 2" students are familiar with the most important concepts of growth theory, they know the microeconomic foundations of modern macroeconomic theory and understand the intertemporal budget constraint of the government. Therefore they are able to discuss the growth and distributional consequences of policy reforms by applying simple economic models.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 60 minutes)		
Allocation of places		
<p>Number of places: 640. No restrictions with regard to available places for Bachelor's students of Wirtschaftswissenschaft (Business Management and Economics), Wirtschaftsmathematik (Mathematics for Economics) and Wirtschaftsinformatik (Business Information Systems). The remaining places will be allocated to students of other subjects. Should the number of applications exceed the number of available places, places will be allocated in a standardised procedure among all applicants irrespective of their subjects according to the following quotas: Quota 1 (50% of places): total number of ECTS credits already achieved in the respective degree subject; among applicants with the same number of ECTS credits achieved, places will be allocated by lot. Quota 2 (25% of places): number of subject semesters of the respective applicant; among applicants with the same number of subject semesters, places will be allocated by lot. Quota 3 (25% of places): allocation by lot. Applicants who already have successfully completed at least one module component of the respective module will be given preferential consideration. Places on all courses of the module component with a restricted number of places will be allocated in the same procedure. A waiting list will be maintained and places re-allocated as they become available.</p>		
Additional information		
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Workload		
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Teaching cycle

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

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Module appears in

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

Module title		Abbreviation
Microeconomics 2		12-Mik2-G-o82-m01
Module coordinator		Module offered by
holder of the Chair of Industrial Economics		Faculty of Business Management and Economics
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	--
Contents		
<p>Outline of syllabus:</p> <ol style="list-style-type: none"> 1. Cost minimisation 2. Profit maximisation and the supply function 3. Short-run market equilibrium 4. Long-run market equilibrium 5. Government interventions 6. Monopoly 7. Pricing strategies with market power 8. Introduction to game theory 9. Strategic interaction and oligopoly 		
Intended learning outcomes		
<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>		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 60 minutes)		
Allocation of places		
<p>Number of places: 405. No restrictions with regard to available places for Bachelor's students of Wirtschaftswissenschaft (Business Management and Economics), Wirtschaftsmathematik (Mathematics for Economics) and Wirtschaftsinformatik (Business Information Systems). The remaining places will be allocated to students of other subjects. Should the number of applications exceed the number of available places, places will be allocated in a standardised procedure among all applicants irrespective of their subjects according to the following quotas: Quota 1 (50% of places): total number of ECTS credits already achieved in the respective degree subject; among applicants with the same number of ECTS credits achieved, places will be allocated by lot. Quota 2 (25% of places): number of subject semesters of the respective applicant; among applicants with the same number of subject semesters, places will be allocated by lot. Quota 3 (25% of places): allocation by lot. Applicants who already have successfully completed at least one module component of the respective module will be given preferential consideration. Places on all courses of the module component with a restricted number of places will be allocated in the same procedure. A waiting list will be maintained and places re-allocated as they become available.</p>		
Additional information		
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Bachelor's with 1 major Mathematics (2012)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Mathematik - 2012	page 226 / 237

Workload
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Teaching cycle
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Referred to in LPO I (examination regulations for teaching-degree programmes)
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Module appears in
<p>Bachelor' degree (1 major) Mathematics (2012)</p> <p>Bachelor' degree (1 major) Mathematics (2013)</p> <p>Bachelor' degree (1 major) Business Management and Economics (2009)</p> <p>Bachelor' degree (1 major) Business Management and Economics (2008)</p> <p>Bachelor' degree (1 major) Business Management and Economics (2010)</p> <p>Bachelor' degree (1 major) Economathematics (2009)</p> <p>Bachelor' degree (1 major) Economathematics (2012)</p> <p>Bachelor' degree (1 major) Economathematics (2008)</p> <p>Bachelor' degree (1 major) Business Information Systems (2009)</p> <p>Bachelor' degree (1 major) Business Information Systems (2008)</p> <p>Master's degree (1 major) China Business and Economics (2014)</p> <p>Master's degree (1 major) China Business and Economics (2012)</p> <p>Bachelor's degree (1 major, 1 minor) Business Management and Economics (Minor, 2008)</p>

Module title			Abbreviation
Introduction to Economic Policy			12-WiPo-G-o82-m01
Module coordinator		Module offered by	
holder of the Chair of Economic Order and Social Policy		Faculty of Business Management and Economics	
ECTS	Method of grading	Only after succ. compl. of module(s)	
5	numerical grade	--	
Duration	Module level	Other prerequisites	
1 semester	undergraduate	--	
Contents			
<p>Description:</p> <p>The course consists of six chapters. The first chapter illustrates what economists have in mind when referring to the term "economic policy" and discusses its objectives, means and institutions. The following chapters deal with the objectives that are set out in the German "Gesetz zur Förderung der Stabilität und des Wachstums der Wirtschaft" ("Law for Promoting Stability and Growth of the Economy") of 1967. Each chapter uses current macroeconomic data to evaluate the degree to which the particular objective is achieved, discusses the reasons of possible problems and demonstrates actions the government may take to cure the problems.</p> <p>Outline of syllabus:</p> <p>1. Introduction</p> <ul style="list-style-type: none">-What is "Economic Policy"?- Objectives of economic policy- Instruments of economic policy- Institutions of economic policy <p>2. Full employment</p> <ul style="list-style-type: none">- Empirics: The status quo of the labour market- Reasons for unemployment- Cure for labour market problems <p>3. Price level stability</p> <ul style="list-style-type: none">- Empirics: inflation, deflation or price stability?- Reasons for inflation and deflation- Cure for price instability- The contradicting relationship between full employment and stable prices <p>4. Business cycles and economic growth</p> <ul style="list-style-type: none">- Empirics: current situation of the world economy and long-term economic growth- Reasons for cyclical fluctuations and determinants of economic growth- Cure for macroeconomic instabilities and means to facilitate economic growth <p>5. Balance in foreign trade</p> <ul style="list-style-type: none">- Empirics: balances of payments of Germany, Europe and the World- Reasons for macroeconomic imbalances- Cure for instabilities in foreign trade <p>6. Income distribution</p> <ul style="list-style-type: none">- Empirics: the distribution of incomes and its historical development- Reasons for an increase in income inequality- Cure for inequality and redistribution			
Intended learning outcomes			
<p>The students gain a basic understanding of the role of the state in national and international economies. Based on a number of macroeconomic models (AS/AD, IS/LM, phillips curve, labor market equilibria, Solow model, Beveridge curve, etc.), students study the ability of the state to influence national and global economies. Students learn to assess in which situations such influence can be welfare-enhancing and under which circumstances governmental interventions may be harmful. After successful completion of the course, students are able to analyze concrete economic situations and to develop policy options of the state. In addition, students have learned to</p>			
Bachelor's with 1 major Mathematics (2012)		JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Mathematik - 2012	page 228 / 237

assess the situation of a country on the basis of empirical macroeconomic data and to explain the particular problems based on different models.

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

V + Ü (no information on SWS (weekly contact hours) and course language available)

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

written examination (approx. 60 minutes)

Allocation of places

Number of places: 405. No restrictions with regard to available places for Bachelor's students of Wirtschaftswissenschaft (Business Management and Economics), Wirtschaftsmathematik (Mathematics for Economics) and Wirtschaftsinformatik (Business Information Systems). The remaining places will be allocated to students of other subjects. Should the number of applications exceed the number of available places, places will be allocated in a standardised procedure among all applicants irrespective of their subjects according to the following quotas: Quota 1 (50% of places): total number of ECTS credits already achieved in the respective degree subject; among applicants with the same number of ECTS credits achieved, places will be allocated by lot. Quota 2 (25% of places): number of subject semesters of the respective applicant; among applicants with the same number of subject semesters, places will be allocated by lot. Quota 3 (25% of places): allocation by lot. Applicants who already have successfully completed at least one module component of the respective module will be given preferential consideration. Places on all courses of the module component with a restricted number of places will be allocated in the same procedure. A waiting list will be maintained and places re-allocated as they become available.

Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Mathematics (2012)
Bachelor' degree (1 major) Mathematics (2013)
Bachelor' degree (1 major) Business Management and Economics (2009)
Bachelor' degree (1 major) Business Management and Economics (2008)
Bachelor' degree (1 major) Business Management and Economics (2010)
Bachelor' degree (1 major) Economathematics (2009)
Bachelor' degree (1 major) Economathematics (2012)
Bachelor' degree (1 major) Economathematics (2008)
Bachelor' degree (1 major) Business Information Systems (2009)
Bachelor' degree (1 major) Business Information Systems (2008)
Bachelor' degree (1 major) Political and Social Studies (2008)
Bachelor' degree (1 major) Political and Social Studies (2011)
Master's degree (1 major) China Business and Economics (2014)
Master's degree (1 major) China Business and Economics (2012)
Bachelor's degree (1 major, 1 minor) Business Management and Economics (Minor, 2010)
Bachelor's degree (1 major, 1 minor) Business Management and Economics (Minor, 2008)

Thesis

(11 ECTS credits)

Module title		Abbreviation
Thesis Mathematics (Bachelor Thesis)		10-M-BAM-122-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)
11	numerical grade	Where applicable, specific modules/module components as specified by supervisor.
Duration	Module level	Other prerequisites
1 semester	undergraduate	--
Contents		
Independently researching and writing on a topic in mathematics selected in consultation with the supervisor.		
Intended learning outcomes		
The student is able to work independently on a given mathematical topic and apply the skills and methods obtained during his/her studies in the bachelor programme. He/She can write down the result of his/her work in a suitable form.		
Courses (type, number of weekly contact hours, language — if other than German)		
no courses assigned		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written thesis Language of assessment: German, English if agreed upon with the examiner		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Mathematics (2014) Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013)		

Subject-specific Key Skills

(16 ECTS credits)

Module title		Abbreviation
Mathematics and Computer		10-M-MCO-122-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)
7	(not) successfully completed	--
Duration	Module level	Other prerequisites
2 semester	undergraduate	By way of exception, additional prerequisites are listed in the section on assessments.
Contents		
Basics of a modern programming language (e. g. C or Fortran) taking into account the particular needs in mathematics.; introduction to modern mathematical software for symbolic computation (e. g. Mathematica or Maple) and numerical computation (e. g. Matlab); computer-based solution of problems in linear algebra, geometry, analysis, in particular differential and integral calculus; visualisation of functions.		
Intended learning outcomes		
The student is able to work on small programming exercises in mathematics. He/She learns the use of advanced modern mathematical software packages, and is able to assess their fields of application to solve mathematical problems.		
Courses (type, number of weekly contact hours, language — if other than German)		
This module comprises 2 module components. Information on courses will be listed separately for each module component. <ul style="list-style-type: none"> 10-M-COM-1-122: V + Ü (no information on SWS (weekly contact hours) and course language available) 10-M-PRG-1-122: P (no information on SWS (weekly contact hours) and course language available) 		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
Assessment in this module comprises the assessments in the individual module components as specified below. Unless stated otherwise, successful completion of the module will require successful completion of all individual assessments.		
Assessment in module component 10-M-COM-1-122: Computational Mathematics Computational Mathematics <ul style="list-style-type: none"> 4 ECTS, Method of grading: (not) successfully completed project in the form of programming exercises (type and expenditure of time to be specified by the lecturer at the beginning of the course) Language of assessment: German, English if agreed upon with the examiner Other prerequisites: Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew. 		
Assessment in module component 10-M-PRG-1-122: Programming course for students of Mathematics and other subjects <ul style="list-style-type: none"> 3 ECTS, Method of grading: (not) successfully completed project in the form of programming exercises (type and expenditure of time to be specified by the lecturer at the beginning of the course) Language of assessment: German, English if agreed upon with the examiner Other prerequisites: Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will 		
Bachelor's with 1 major Mathematics (2012)		JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Mathematik - 2012
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put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew.

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Mathematics (2012)
Bachelor' degree (1 major) Mathematics (2013)
Bachelor' degree (1 major) Computational Mathematics (2012)
Bachelor' degree (1 major) Computational Mathematics (2013)

Module title		Abbreviation
Introduction into mathematical thinking and working		10-M-MDA-122-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)
4	(not) successfully completed	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	By way of exception, additional prerequisites are listed in the section on assessments.
Contents		
Logical foundations of mathematical proofs, in particular axiomatic and deduction; basic concepts in mathematics, e. g. sets and functions; basic techniques and methods for proving; mathematical writing.		
Intended learning outcomes		
The student is acquainted with the basic proof methods and techniques in mathematics. He/She is able to perform easy mathematical arguments independently and present them adequately and reasonably in written and oral form.		
Courses (type, number of weekly contact hours, language — if other than German)		
This module comprises 2 module components. Information on courses will be listed separately for each module component. <ul style="list-style-type: none"> 10-M-MDA-1-122: V + Ü (no information on SWS (weekly contact hours) and course language available) 10-M-MDA-2-122: V + Ü (no information on SWS (weekly contact hours) and course language available) 		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
Assessment in this module comprises the assessments in the individual module components as specified below. Unless stated otherwise, successful completion of the module will require successful completion of all individual assessments.		
Assessment in module component 10-M-MDA-1-122: Basic Notions and Methods of Mathematical Reasoning Basic Notions and Methods of Mathematical Reasoning <ul style="list-style-type: none"> 2 ECTS, Method of grading: (not) successfully completed project assignments (type and expenditure of time to be specified by the lecturer at the beginning of the course) Language of assessment: German, English if agreed upon with the examiner Other prerequisites: Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew. 		
Assessment in module component 10-M-MDA-2-122: Reasoning and Writing in Mathematics Reasoning and Writing in Mathematics <ul style="list-style-type: none"> 2 ECTS, Method of grading: (not) successfully completed project assignments (type and expenditure of time to be specified by the lecturer at the beginning of the course) Language of assessment: German, English if agreed upon with the examiner Other prerequisites: Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to 		
Bachelor's with 1 major Mathematics (2012)		JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Mathematik - 2012
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assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew.
Allocation of places
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Additional information
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Workload
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Teaching cycle
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Referred to in LPO I (examination regulations for teaching-degree programmes)
§ 73 (1) 5. Mathematik Angewandte Mathematik
Module appears in
Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Economathematics (2012) Bachelor' degree (1 major) Mathematical Physics (2012) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) First state examination for the teaching degree Gymnasium Mathematics (2012)

Module title		Abbreviation
Seminar Mathematics		10-M-SEM-122-m01
Module coordinator		Module offered by
Dean of Studies Mathematik (Mathematics)		Institute of Mathematics
ECTS	Method of grading	Only after succ. compl. of module(s)
5	(not) successfully completed	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew.
Contents		
A selected topic in mathematics.		
Intended learning outcomes		
The student gains first experience with independent scientific work. He/She masters elaboration and structuring of a given topic using selected literature, and prepares a talk on the subject. He/She is able to participate actively in a scientific discussion.		
Courses (type, number of weekly contact hours, language — if other than German)		
S (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
talk (approx. 60 to 180 minutes) Language of assessment: German, English if agreed upon with the examiner		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Mathematical Physics (2012) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) First state examination for the teaching degree Gymnasium Mathematics (2012)		