Julius-Maximilians-
UNIVERSITÄT
WÜRZBURG

Subdivided Module Catalogue

for the Subject

Biology

as a Bachelor's with 1 major

with the degree "Bachelor of Science"

(180 ECTS credits)

Examination regulations version: 2007
Responsible: Faculty of Biology

Course of Studies - Contents and Objectives

No translation available.

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:

ASPO2007

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

09-Mar-2009 (2008-33) except for new versions of some modules

22-Dec-2009 (2009-98)

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.

The subject is divided into

07-4BFPS4-092-m01	Basics plant Ecophysiology	5	NUM	69
07-4BFPS5-092-m01	Pharmaceutical bio analytics	5	NUM	70
Special Biosciences I (5 ECTS credits)				
03-4S1HG-092-m01	Human Genetics	5	NUM	8
03-4S1IM-092-m01	Immunology I	5	NUM	10
03-4S1PC-092-m01	Physiological Chemistry I	5	NUM	12
03-4S1VL-092-m01	Virology I	5	NUM	13
07-4S1MZ1-092-m01	Advanced Light- and Electron-Microscopy	3	NUM	71
07-4S1MZ2-092-m01	Analysis of Chromosomes	3	NUM	72
07-4S1MZ3-092-m01	Ecology and Developmental Biology of marine organisms	5	NUM	73
07-4S1MZ4-092-m01	Methods in Biotechnology	2	NUM	75
07-4S1MZ5-092-m01	Aspects of modern Biotechnology	2	NUM	76
07-4S1MZ6-092-m01	Special Bioinformatics I	5	NUM	77
07-4S1NVO1-092-m01	Neurobiology I	5	NUM	78
07-4S1NVO2-092-m01	Aspects of Integrative Behavioural Biology	5	NUM	79
07-4S1NVO3-092-m01	Functional Morphology of arthropods	5	NUM	81
07-4S1NVO4-092-m01	Ecology of insects	5	NUM	83
07-4S1NVO5-092-m01	Ecology of populations	5	NUM	84
07-4S1PS1-092-m01	Molecular modelling - From DNA to protein	5	NUM	85
07-4S1PS2-092-m01	Introduction Methods in Plant Ecophysiology	5	NUM	86
07-4S1PS3-092-m01	Pharmaceutical Drugs	5	NUM	87
07-4S1PS4-092-m01	Methods Pharmaceutical Biology - practical course	5	NUM	88
08-BCB-072-m01	Biochemistry for students of biological sciences	6	NUM	143
08-BCPB-072-m01	Biochemistry for students of biological sciences (practical course)	5	B/NB	144
Special Biosciences II (20 ECTS credits)				
07-5S2NVO1-092-m01	Neurobiology II	10	NUM	96
07-5S2NVO2-092-m01	Integrative Behavioural Biology II	10	NUM	97
07-5S2NVO3-092-m01	Ecology of animals II	10	NUM	98
07-5S2MZ1-092-m01	Methods in molecular cell - and developmental Biology	10	NUM	91
07-5S2MZ2-092-m01	Specific Microbiology II	10	NUM	93
07-5S2MZ3-092-m01	Specific Bioinformatics II	10	NUM	94
07-5S2MZ4-092-m01	Specific Biotechnology II	10	NUM	95
07-5S2PS1-092-m01	Physiology of membrane transport mechanisms	10	NUM	100
07-5S2PS2-092-m01	Molecular biology of plants	10	NUM	101
07-5S2PS3-092-m01	Protein biochemistry and expression of recombinant proteins	10	NUM	102
07-5S2PS4-092-m01	Specific ecophysiology of plants	10	NUM	103
07-5S2PS5-092-m01	Molecular biological methods in pharmaceutical biology	10	NUM	104
07-5S2PS6-092-m01	Biochemical methods in pharmaceutical Biology	10	NUM	105
03-5S2IM-092-m01	Immunology II	10	NUM	15
03-5S2VL-092-m01	Virology II	10	NUM	23
03-5S2PC-092-m01	Physiological Chemistry II	10	NUM	20
03-5S2KB-092-m01	Clinical Biochemistry / Laboratory Medicine 1	10	NUM	16
03-5S2ST-092-m01	Structural Biology 1	10	NUM	22
03-5S2ZT-092-m01	Cellular tumour biology 1	10	NUM	26
03-5S2ZM-092-m01	Cellular Molecular biology 1	10	NUM	25

03-5S2KN-092-m01	Clinical Neurobiology 1	10	NUM	18
07-5EP-072-m01	External Practical Course	10	NUM	90
07-5AP-072-m01	Practical Course as exchange student	10	NUM	89
Special Biosciences III (15 ECTS credits)				
07-6S3NVO1-092-m01	Neurobiology III	15	NUM	113
07-6S3NVO2-092-m01	Integrative Behavioural Biology III	15	NUM	114
07-6S3NVO3-092-m01	Ecology of animals III	10	NUM	116
07-6S3NVO4-092-m01	Ecological modelling	5	NUM	117
07-6S3NVO5-092-m01	Tropical Biology	5	NUM	118
07-6S3NVO6-092-m01	Biology of nature conservation	5	NUM	119
07-6S3MZ1-092-m01	Molecular Cell Biology for advanced students	15	NUM	108
07-6S3MZ-2-092-m01	Molecular Developmental Biology for advanced students	15	NUM	109
07-6S3MZ-3-092-m01	Specific Microbiology III	15	NUM	110
07-6S3PS5-092-m01	Research Project in Pharmaceutical Biology with Focus on Molecular Biology	15	NUM	128
07-6S3PS6-092-m01	Research Project in Pharmaceutical Biology with Focus on Molecular Biochemistry	15	NUM	130
03-6S3IM-092-m01	Immunology 3	15	NUM	28
03-6S3VL-092-m01	Virology 3	15	NUM	36
03-6S3KB-092-m01	Clinical Biochemistry /Laboratory Medicine 2	15	NUM	29
03-6S3PC-092-m01	Physiological Chemistry 3	15	NUM	32
03-6S3ST-092-m01	Structural Biology 2	15	NUM	34
03-S63ZT-092-m01	Cellular Tumour Biology 2	15	NUM	39
03-6S3ZM-092-m01	Cellular Molecular Biology 2	15	NUM	37
03-6S3PH-092-m01	Physiology	15	NUM	33
03-6S3KN-092-m01	Clinical Neurobiology 2	15	NUM	30
07-6S3MZ4-092-m01	Specific Biotechnology III	15	NUM	111
07-6S3MZ5-092-m01	Specific Bioinformatics III	15	NUM	112
07-6S3PS1-092-m01	Specific Aspects in Plant Molecular Biology	15	NUM	120
07-6S3PS2-092-m01	Protein Chemistry in Biosensorics	15	NUM	122
07-6S3PS3-092-m01	Experimental biology of membrane transport mechanisms	15	NUM	124
07-6S3PS4-092-m01	Scientific experimental work in plant ecophysiology	15	NUM	126
Thesis (10 ECTS credits)				
07-6BT-072-m01	Bachelorthesis Biology	12	NUM	107
Subject-specific Key Skills (15 ECTS credits)				
07-6BK-072-m01	Final oral examination in Biology	3	NUM	106
07-SQF-BGA-092-m01	Biotechnology and Social Acceptance	3	NUM	132
07-SQF-DBP-092-m01	Data Processing in Plant Sciences	2	NUM	133
07-SQF-GHE-092-m01	Global Acting in globally and locally linked decision processes	3	NUM	134
07-SQF-HVB-092-m01	Outstanding Publications in Biology	2	NUM	135
07-SQF-PRB-092-m01	Patents in Biology	2	NUM	136
07-SQF-SAL-092-m01	Operational Safety in ecophysiological Laboratories	1	NUM	137
07-SQF-TFB-072-m01	Supervising Tutorial for Basic Courses	4	B/NB	138
07-SQF-TSB-072-m01	Supervising Tutorial for Biology	3	B/NB	139
07-SQF-UBG-092-m01	Environmental Education in the Botanical Garden of the University	2	NUM	140

07-SQF-WIP-092-m01	Publishing Scientific Data	3	NUM	141

Module title			Abbreviation
Human Genetics			03-4S1HG-092-m01
Module coordinator		**Module offered by**	
holder of the Chair of of Human Genetics		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	By way of exception, additional prerequisites are listed in the section on assessments.	

Contents

Fundamentals of and analytical methods in human and vertebrate cytogenetics. Characterisation of the normal human karyotype and chromosome aberrations. Introduction to chromosome evolution.

Intended learning outcomes

Students who complete this module will acquire the theoretical basis of and practical experience in human cytogenetics. They will learn how to prepare and identify human chromosomes and critically interpret cytogenetic findings.

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.

- 03-4S1HG-1HZ-092: V + Ü (no information on SWS (weekly contact hours) and course language available)
- 03-4S1HG-2HZ-092: 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 can be chosen to earn a 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 03-4S1HG-1HZ-092: Human Genetics (Lecture and Laboratory Practice) Human Genetics (Lecture and Laboratory Practice)

- 3 ECTS, Method of grading: numerical grade
- 2 written examinations (multiple choice): mid-semester examination (15 minutes), end-of-semester examination (20 minutes)
- Other prerequisites: A basic knowledge of genetics is recommended.

Assessment in module component 03-4S1HG-2HZ-092: Human Genetics (Seminar)

- 2 ECTS, Method of grading: (not) successfully completed
- presentation (approx. 20 to 30 minutes)
- Other prerequisites: A basic knowledge of genetics is recommended.

Allocation of places

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Additional information

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Workload

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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 (2007)
Bachelor' degree (1 major) Mathematics (2007)

Bachelor's degree (1 major, 1 minor) Biology (Minor, 2008)

Module title			Abbreviation
Immunology I			03-4S1IM-092-m01
Module coordinator		**Module offered by**	
holder of the Professorship of Immunogenetics		Faculty of Medicine	
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 gives an introduction to immunology. The following questions will be addressed: How does the body recognise and eliminate pathogens and tumour cells? How can the immune system damage its own body (allergies, autoimmunity)? Organs, cells and molecules of the immune system will be presented with an emphasis on genetic and molecular mechanisms of recognition and elimination of foreign substances by the immune system. The most important immunological techniques will be introduced and applied.

Intended learning outcomes

The students acquire a practical knowledge of cellular and molecular techniques for the analysis of the immune system. The are familiar with the mechanisms of self and non-self discrimination by the adaptive and innate immune systems. They acquire a fundamental knowledge of lymphocyte development as well as major immune effector cell functions and molecules.

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.

- 03-4S1IM-1IM-092: V + Ü (no information on SWS (weekly contact hours) and course language available)
- 03-4S1IM-2IM-092: 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 can be chosen to earn a 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 03-4S1IM-1IM-092: Introduction into Immunology (Lecture and Practice) Introduction into Immunology (Lecture and Practice)

- 2 ECTS, Method of grading: numerical grade
- written examination (30 minutes)
- Language of assessment: German, English where required

Assessment in module component 03-4S1IM-2IM-092: Immunology (Laboratory Course)

- 3 ECTS, Method of grading: (not) successfully completed
- presentation (approx. 20 to 30 minutes)
- Language of assessment: German, English where required

Allocation of places

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Additional information

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Workload

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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 (2007)

Bachelor' degree (1 major) Mathematics (2007)

Module title			Abbreviation
Physiological Chemistry I			03-4S1PC-092-m01
Module coordinator		**Module offered by**	
holder of the Chair of Physiological Chemistry		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

General anatomy, physiology and developmental biology of fishes. Special usefulness of the mainstream fish model systems (zebrafish, medaka, Xiphophorus) for biomedical research. Phenotyping of mutants. Microinjection of DNA and RNA in single-cell embryos. Fluorescent microscopy-based bioimaging techniques. Visualisation of selected tissues and organs (neural tissues, cartilage). In-situ hybridisation of mRNA. Immunhistochemical detection of proteins in-situ. Demonstration of basic techniques for electron microscopy. Behavioural analyses of locomotor activity.

Intended learning outcomes

Students are able to independently produce transient transgenic fish. They are able to delineate and describe temporal and spatial RNA and protein expression in situ, appraise expression patterns and recognise phenotypes of developmental mutants. They are able to evaluate fish models of biomedicine for their usefulness to answer specific questions.

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 can be chosen to earn a bonus)

written examination (60 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)
Bachelor' degree (1 major) Mathematics (2007)

Module title			Abbreviation
Virology I			03-4S1VL-092-m01
Module coordinator		**Module offered by**	
holder of the Chair of Virology		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

Working safely in a BSL-2 laboratory; cell culture; virus production; virus titration; virus sequencing; phylogenetic analysis of a viral quasispecies.

Intended learning outcomes

Students have developed a fundamental knowledge in molecular virology concerning the structure and replication of viruses, virus-host cell interactions and mechanisms of action of antiviral compounds. They are able to apply cell and molecular techniques of virological basic science.

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.

- 03-4S1VL-1VL-092: V (no information on SWS (weekly contact hours) and course language available)
- 03-4S1VL-3VL-092: P (no information on SWS (weekly contact hours) and course language available)
- 03-4S1VL-2VL-092: 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 can be chosen to earn a 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 03-4S1VL-1VL-092: Basic Virology (Lecture and Practice)

- 1 ECTS, Method of grading: numerical grade
- written examination (20 minutes)
- Language of assessment: German, English where required

Assessment in module component 03-4S1VL-3VL-092: Virology (Laboratory Course)

- 3 ECTS, Method of grading: numerical grade
- written examination (20 minutes) or oral examination (20 minutes)
- Language of assessment: German, English

Assessment in module component 03-4S1VL-2VL-092: Seminar on General Virology

- 1 ECTS, Method of grading: (not) successfully completed
- presentation (approx. 20 to 30 minutes)
- Language of assessment: German, English where required

Allocation of places

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Additional information

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Workload

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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 (2007)

Bachelor' degree (1 major) Mathematics (2007)

Module title			Abbreviation
Immunology II			03-5S2IM-092-m01
Module coordinator			**Module offered by**
holder of the Professorship of Immunogenetics			Faculty of Medicine
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

Specific problems in immunology such as immune modulation, immunogenetics, infection immunology, signal transduction in immune cells.

Intended learning outcomes

The students acquire specific competence about the functional mechanisms of the immune system. They are qualified to plan and perform experiments under supervision and present the data, taking into account current literature.

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

V + 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 can be chosen to earn a bonus)

a) written examination (approx. 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 (groups of up to 3 candidates, approx. 60 minutes) or e) presentation (approx. 20 to 30 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)
Bachelor' degree (1 major) Mathematics (2007)

Module title			Abbreviation
Clinical Biochemistry / Laboratory Medicine 1			03-5S2KB-092-m01
Module coordinator		**Module offered by**	
holder of the Chair of Biochemistry		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

Basic research practice and analytical approaches that are used in pathobiology and clinical biochemistry are presented by means of selected examples. Pathological mechanisms are compared to the respective regular physiological processes (e. g. thrombocyte function, cardiovascular transformation) and the underlying biochemical and genetic variations are discussed.

Intended learning outcomes

Students have developed a fundamental knowledge of techniques and approaches that are commonly used in modern molecular biology and biochemistry and have developed a fundamental understanding of how to approach, analyse and interpret problems in clinical biochemistry. They also have developed skills in experimental design, bench work, data analysis and the presentation of scientific results both orally and in writing.

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.

- 03-5S2KB-1KB-092: Ü (no information on SWS (weekly contact hours) and course language available)
- 03-5S2KB-2KB-092: 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 can be chosen to earn a 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 03-5S2KB-1KB-092: Clinical biochemistry / laboratory medicine 1 (laboratory practice)

- 8 ECTS, Method of grading: numerical grade
- a) written examination (approx. 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 (groups of 2 or 3 candidates, approx. 60 minutes) or e) presentation (approx. 20 to 30 minutes)
- Language of assessment: German, English

Assessment in module component 03-5S2KB-2KB-092: Clinical biochemistry / laboratory medicine 1 - Seminar clinical biochemistry

- 2 ECTS, Method of grading: (not) successfully completed
- presentation (approx. 20 to 30 minutes)
- Language of assessment: German, English where required

Allocation of places

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Additional information

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Workload

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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 (2007)

Module title			Abbreviation
Clinical Neurobiology 1			03-5S2KN-092-m01
Module coordinator		**Module offered by**	
holder of the Chair of Clinical Neurobiology		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

Students who successfully completed this module will have acquired insights into the foundations of clinical neurobiology. In this module, the cellular and molecular mechanisms which are important for survival as well as the cell death of neurons and glial cells of vertebrates will be compared during development as well as under pathological conditions. The module will also focus on the function of neurons and glial cells, synaptic activity, plasticity as well as disturbances in these functions and diseases of the nervous system, comparison of physiological processes in pathological conditions of neurodegenerative disorders such as motoneuron disorders. Using distinct examples in neurobiology, molecular genetic and functional biochemical connections will be analysed.

Intended learning outcomes

Students who successfully complete this module will have a fair knowledge of the basic functions of the nervous system. Students will be able to independently work on a distinct project using techniques of modern neurobiology, to solve general problems and to understand the mechanisms of neurodegenerative disorders. They will be able to analyse data and to interpret it in the context of literature. They will also have developed skills in experimental design, bench work, data analysis and the presentation of scientific results both orally and in writing.

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.

- 03-5S2KN-1KN-092: Ü (no information on SWS (weekly contact hours) and course language available)
- 03-5S2KN-2KN-092: 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 can be chosen to earn a 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 03-5S2KN-1KN-092: Clinical neurobiology 1 (laboratory course)

- 8 ECTS, Method of grading: numerical grade
- a) written examination (approx. 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 (groups of 2 or 3 candidates, approx. 60 minutes) or e) presentation (approx. 20 to 30 minutes)
- Language of assessment: German, English

Assessment in module component 03-5S2KN-2KN-092: Clinical neurobiology 1 (seminar)

- 2 ECTS, Method of grading: (not) successfully completed
- presentation (approx. 20 to 30 minutes)
- Language of assessment: German, English where required

Allocation of places

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Additional information

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Workload

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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 (2007)

Module title			Abbreviation
Physiological Chemistry II			03-5S2PC-092-m01
Module coordinator			**Module offered by**
holders of the Chairs of Physiological Chemistry, Developmental Biochemistry, Biochemistry and Molecular Biology			Faculty of Medicine
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

Fundamentals and analytical approaches of physiological chemistry are taught based on selected questions from human biochemistry. Physiological processes are compared with examples of pathological aberrations. Molecular genetic and functional biochemical networks are presented using examples from developmental biochemistry, pathobiochemistry and cellular biochemistry.

Intended learning outcomes

Students have developed the ability to approach, analyse and interpret general problems in physiological chemistry based on individually assigned tasks, using techniques of modern molecular biology and biochemistry. They also have developed skills in experimental design, bench work, data analysis and the presentation of scientific results.

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

This module comprises 2 module components. Information on courses will be listed separately for each module component.

- 03-5S2PC-1HB1-092: Ü (no information on SWS (weekly contact hours) and course language available)
- 03-5S2PC-2HB-092: 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 can be chosen to earn a 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 03-5S2PC-1HB1-092: Physiological chemistry 2 - Human biochemistry (laboratory course)

- 9 ECTS, Method of grading: numerical grade
- a) written examination (approx. 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 (groups of 2 or 3 candidates, approx. 60 minutes) or e) presentation (approx. 20 to 30 minutes)
- Language of assessment: German, English

Assessment in module component 03-5S2PC-2HB-092: Physiological chemistry 2 - Seminar on human biochemistry 1

- 1 ECTS, Method of grading: (not) successfully completed
- presentation (approx. 20 to 30 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)
Bachelor' degree (1 major) Mathematics (2007)

Module title			Abbreviation
Structural Biology 1			03-5S2ST-092-m01
Module coordinator		**Module offered by**	
holder of the Chair of Structural Biology		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

This module provides a brief introduction to crystallography and commonly used biophysical techniques as well as the fundamental principles of macromolecular architectures. Building on this, the structure and function of selected biological macromolecules are presented. In small groups, participants will analyse one specific macromolecule in silico with respect to its structure and biological function and will present their results in a talk. The various macromolecules in their entirety reflect a number of important biological problems.

Intended learning outcomes

On the basis of individually assigned model proteins, the students will acquire the ability to explore common problems in structural biology and to analyse structure-function relationships. They will also acquire skills in the oral presentation of scientific results as well as in the in silico analysis of biological macromolecules.

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 can be chosen to earn a bonus)

a) written examination (approx. 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 (groups of up to 3 candidates, approx. 60 minutes) or e) presentation (approx. 20 to 30 minutes)

Allocation of places

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Additional information

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Workload

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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 (2009)
Bachelor' degree (1 major) Biology (2007)

Module title			Abbreviation
Virology II			03-5S2VL-092-m01
Module coordinator		**Module offered by**	
holder of the Chair of Virology		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

This module addresses special virological problems using selected examples such as viral pathogenesis, interaction of viruses with host cells or the complete host, new developments in molecular virology, prevention and treatment of viral infections and the pathogenesis of prion diseases.

Intended learning outcomes

The students have acquired a specific knowledge of molecular virology. They are able to plan and perform experiments under guidance as well as to present them, taking into account current literature.

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.

- 03-5S2VL-1VL-092: V (no information on SWS (weekly contact hours) and course language available)
- 03-5S2VL-2VL-092: S (no information on SWS (weekly contact hours) and course language available)
- 03-5S2VL-3VL-092: 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 can be chosen to earn a 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 03-5S2VL-1VL-092: Virology 2 (lecture)

- 1 ECTS, Method of grading: numerical grade
- written examination (30 minutes)
- Language of assessment: German, English where required

Assessment in module component 03-5S2VL-2VL-092: Virology 2 (seminar)

- 1 ECTS, Method of grading: (not) successfully completed
- presentation (approx. 20 to 30 minutes)
- Language of assessment: German, English

Assessment in module component 03-5S2VL-3VL-092: Virology 2 (laboratory course)

- 8 ECTS, Method of grading: numerical grade
- written examination (20 minutes) or oral examination (20 minutes)
- Language of assessment: German, English where required

Allocation of places

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Additional information

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Workload

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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 (2007)

Bachelor' degree (1 major) Mathematics (2007)

Module title			Abbreviation
Cellular Molecular biology 1			03-5S2ZM-092-m01
Module coordinator		**Module offered by**	
Institute of Medical Radiology and Cell Research (MSZ)		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

In this module, current problems in the research areas of stem cell biology and cellular differentiation will be discussed and specific solutions will be taught. With the help of selected examples, participants will acquire practical molecular biological techniques.

Intended learning outcomes

Students have developed the ability to approach, analyse and critically interpret current problems in cellular molecular biology based on individually assigned tasks, using techniques of modern molecular and cell biology. They also have developed skills in experimental design, bench work, data analysis and the presentation of scientific results both orally and in writing.

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.

- 03-5S2ZM-1ZM-092: Ü (no information on SWS (weekly contact hours) and course language available)
- 03-5S2ZM-2ZM-092: 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 can be chosen to earn a 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 03-5S2ZM-1ZM-092: Cellular molecular biology 1 (laboratory course)

- 8 ECTS, Method of grading: numerical grade
- a) written examination (approx. 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 (groups of 2 or 3 candidates, approx. 60 minutes) or e) presentation (approx. 20 to 30 minutes)
- Language of assessment: German, English

Assessment in module component 03-5S2ZM-2ZM-092: Cellular molecular biology 1 - Current topics in molecular biology (seminar)

- 2 ECTS, Method of grading: (not) successfully completed
- presentation (approx. 20 to 30 minutes)
- Language of assessment: German, English where required

Allocation of places

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Additional information

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Workload

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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 (2007)

Module title			Abbreviation
Cellular tumour biology 1			03-5S2ZT-092-m01
Module coordinator		**Module offered by**	
Chair of Rudolf Virchow Center for Experimental Biomedicine		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

Using specific examples and applying both biochemical analytical procedures and imaging techniques, this module will provide students with fundamental insights into cellular tumour biology and will acquaint them with the approaches of cellular tumour biology. With the help of selected examples, the module will explain fundamental causal relationships and approaches.

Intended learning outcomes

Students have developed the ability to approach, analyse and critically interpret general problems in tumour biology based on individually assigned tasks, using techniques of modern cell biology and, in particular, imaging methods. They also have developed skills in experimental design, bench work, data analysis and the presentation of scientific results.

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

This module comprises 2 module components. Information on courses will be listed separately for each module component.

- 03-5S2ZT-1ZT-092: Ü (no information on SWS (weekly contact hours) and course language available)
- 03-5S2ZT-2T-092: 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 can be chosen to earn a 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 03-5S2ZT-1ZT-092: Cellular tumour biology 1 (laboratory course)

- 9 ECTS, Method of grading: numerical grade
- a) written examination (approx. 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 (groups of 2 or 3 candidates, approx. 60 minutes) or e) presentation (approx. 20 to 30 minutes)
- Language of assessment: German, English

Assessment in module component 03-5S2ZT-2T-092: Cellular tumour biology 1 - Current topics in tumour biology (seminar)

- 1 ECTS, Method of grading: (not) successfully completed
- presentation (approx. 20 to 30 minutes)
- Language of assessment: German, English where required

Allocation of places

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Additional information

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Workload

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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 (2007)

Module title			Abbreviation
Immunology 3			03-6S3IM-092-m01
Module coordinator		**Module offered by**	
holder of the Professorship of Immunogenetics		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
15	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

In 6-week lab courses that will be accompanied by seminars, the module will address specific problems in immunology such as immunomodulation, immunogenetics, infection immunology, signal transduction in immune cells.

Intended learning outcomes

The students acquire extended knowledge and skills in the area of immune functions. They are qualified to plan and perform experiments under supervision and present the data, taking into account current literature.

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.

- 03-6S3IM-1IM-092: P (no information on SWS (weekly contact hours) and course language available)
- 03-6S3IM-2IM-092: 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 can be chosen to earn a 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 03-6S3IM-1IM-092: Immunology 3 (laboratory course)

- 13 ECTS, Method of grading: numerical grade
- a) written examination (approx. 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 (groups of 2 or 3 candidates, approx. 60 minutes) or e) presentation (approx. 20 to 30 minutes)
- Language of assessment: English

Assessment in module component 03-6S3IM-2IM-092: Immunology 3 - Seminar on cellular and molecular immunology

- 2 ECTS, Method of grading: (not) successfully completed
- presentation (approx. 20 to 30 minutes)
- Language of assessment: English

Allocation of places

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Additional information

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Workload

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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 (2007)

Module title			Abbreviation
Clinical Biochemistry /Laboratory Medicine 2			03-6S3KB-092-m01
Module coordinator		**Module offered by**	
holder of the Chair of Biochemistry		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
15	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

Basic research practice and analytical approaches that are used in clinical biochemistry II are presented by means of selected examples. Pathological mechanisms are compared to the respective regular physiological processes (e. g. thrombocyte function, cardiovascular transformation). Molecular genetic and functional biochemical networks are presented using examples from pathobiochemistry and cellular biochemistry.

Intended learning outcomes

Students have developed a fundamental knowledge of techniques and approaches that are commonly used in modern molecular biology and biochemistry and have developed a fundamental understanding of how to approach, analyse and interpret problems in clinical biochemistry. They also have developed skills in experimental design, bench work, data analysis and the presentation of scientific results both orally and in writing.

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 can be chosen to earn a bonus)

a) written examination (approx. 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 (groups of up to 3 candidates, approx. 60 minutes) or e) presentation (approx. 20 to 30 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)

Module title	Abbreviation
Clinical Neurobiology 2	03-6S3KN-092-m01

Module coordinator	Module offered by
holder of the Chair of Clinical Neurobiology in cooperation with the Institute of Medical Radiology and Cell Research (MSZ), Neurology and Psychology	Faculty of Medicine

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

Duration	Module level	Other prerequisites
1 semester	undergraduate	--

Contents

Using the example of specific problems in the neurobiology of humans, this module will acquaint students with the fundamental principles of as well as analytical techniques used in clinical neurobiology. Physiological processes will be compared with pathological conditions (e. g. Parkinson's and Alzheimer's disease). Using selected examples of neurobiology, the module will discuss molecular, genetic and functional biochemical correlations to distinct diseases.

Intended learning outcomes

Students who successfully complete this module will have a fair knowledge that will enable them to work on individual tasks, using techniques of modern neurobiology to solve, analyse and interpret general problems. Students will also have a fair knowledge that will enable them to plan and perform experiments as well as to interpret their data and present their research results both orally and in writing.

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.

- 03-6S3KN-1KN-092: Ü (no information on SWS (weekly contact hours) and course language available)
- 03-6S3KN-2KN-092: 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 can be chosen to earn a 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 03-6S3KN-1KN-092: Clinical neurobiology 2 (laboratory course)

- 13 ECTS, Method of grading: numerical grade
- a) written examination (approx. 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 (groups of 2 or 3 candidates, approx. 60 minutes) or e) presentation (approx. 20 to 30 minutes)
- Language of assessment: German, English

Assessment in module component 03-6S3KN-2KN-092: Clinical neurobiology 2 (seminar)

- 2 ECTS, Method of grading: (not) successfully completed
- presentation (approx. 20 to 30 minutes)
- Assessment offered: once a year, winter semester
- Language of assessment: German, English where required

Allocation of places

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Additional information

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Workload

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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 (2007)

Module title			Abbreviation
Physiological Chemistry 3			03-6S3PC-092-m01
Module coordinator		**Module offered by**	
holder of the Chair of Physiological Chemistry		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
15	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

Advanced knowledge and research-oriented approaches of physiological chemistry are taught based on selected questions from human biochemistry. Physiological processes are compared with examples of pathological aberrations. Molecular genetic and functional biochemical networks are presented using examples from developmental biochemistry, pathobiochemistry and cellular biochemistry.

Intended learning outcomes

Students have developed the ability to approach, analyse and interpret special problems in physiological chemistry based on individually assigned tasks, using techniques of modern molecular biology and biochemistry. They also have developed in-depth skills in experimental design, bench work, data analysis and the 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 can be chosen to earn a bonus)

a) written examination (approx. 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 (groups of up to 3 candidates, approx. 60 minutes) or e) presentation (approx. 20 to 30 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)

Module title			Abbreviation
Physiology			03-6S3PH-092-m01
Module coordinator		**Module offered by**	
holder of the Chair of Physiology I		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
15	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

In this module, students will become familiar with the fundamental principles of as well as analytical procedures in physiology. Physiological processes will be compared with pathological conditions (e. g. hormonal or cardiovascular disorders). Using selected examples of physiological and pathophysiological conditions, the module will explain the underlying physiological und biochemical mechanisms.

Intended learning outcomes

Students have developed the ability to approach, analyse and interpret specific problems in physiology based on individually assigned tasks, using techniques of modern physiology and biochemistry. They also have developed skills in experimental design, bench work, data analysis and the 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 can be chosen to earn a bonus)

a) written examination (approx. 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 (groups of up to 3 candidates, approx. 60 minutes) or e) presentation (approx. 20 to 30 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)

Module title			Abbreviation
Structural Biology 2			03-6S3ST-092-m01
Module coordinator		**Module offered by**	
holder of the Chair of Structural Biology		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
15	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

This module will use examples from current research reflecting different topics to provide fundamental biological insights and to also illustrate the fundamental concepts of structural biology. Scientific projects may be selected from the following list: DNA repair, ubiquitin-dependent protein degradation, transport and anchoring of inhibitory neurotransmitter receptors and structure-based design of new pharmaceutical agents.

Intended learning outcomes

Students will gain the ability to solve problems in structural biology on the basis of individually assigned tasks, employing different techniques from the fields of molecular biology, biochemistry and crystallography. They will also acquire skills in the design of experiments, their performance and evaluation as well as in the oral and written presentation of scientific results.

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

This module comprises 2 module components. Information on courses will be listed separately for each module component.

- 03-6S3ST-1ST-092: S + P (no information on SWS (weekly contact hours) and course language available)
- 03-6S3ST-2ST-092: 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 can be chosen to earn a 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 03-6S3ST-1ST-092: Structural biology 2 (seminar and laboratory course)
Structural biology 2 (seminar and laboratory course)

- 13 ECTS, Method of grading: numerical grade
- a) written examination (approx. 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 (groups of 2 or 3 candidates, approx. 60 minutes) or e) presentation (approx. 20 to 30 minutes)
- Assessment offered: once a year, winter semester
- Language of assessment: English

Assessment in module component 03-6S3ST-2ST-092: Structural biology 2 (literature seminar)

- 2 ECTS, Method of grading: (not) successfully completed
- presentation (approx. 20 to 30 minutes)
- Assessment offered: once a year, winter semester
- Language of assessment: English

Allocation of places

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Additional information

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Workload

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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 (2007)

Module title			Abbreviation
Virology 3			03-6S3VL-092-m01
Module coordinator		**Module offered by**	
holder of the Chair of Virology		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
15	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

In 6-week lab courses that will be accompanied by seminars, the module will address specific and current problems in virology and, in particular, questions of the viral pathogenesis of selected viruses and viral gene therapy.

Intended learning outcomes

The students acquire an advanced knowledge of molecular and cellular virology including the application of viral vectors (retroviral, adenoviral or AAV-based vectors) for gene therapy of innate or acquired diseases. They also develop skills in experimental design, the performance and evaluation of experiments as well as in the oral and written presentation of scientific results, taking into account current literature.

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.

- 03-6S3VL-1VL-092: P (no information on SWS (weekly contact hours) and course language available)
- 03-6S3VL-2VL-092: 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 can be chosen to earn a 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 03-6S3VL-1VL-092: Virology 3 (laboratory course)

- 13 ECTS, Method of grading: numerical grade
- a) written examination (approx. 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 (groups of 2 or 3 candidates, approx. 60 minutes) or e) presentation (approx. 20 to 30 minutes)
- Language of assessment: English

Assessment in module component 03-6S3VL-2VL-092: Virology 3 (seminar)

- 2 ECTS, Method of grading: (not) successfully completed
- presentation (approx. 20 to 30 minutes)
- Language of assessment: English

Allocation of places

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Additional information

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Workload

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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 (2007)

Module title			Abbreviation
Cellular Molecular Biology 2			03-6S3ZM-092-m01
Module coordinator		**Module offered by**	
Institute of Medical Radiology and Cell Research (MSZ)		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
15	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

In this module, current problems in the research areas of stem cell biology and cellular differentiation will be discussed and specific solutions will be taught. With the help of selected examples, participants will acquire practical molecular biological techniques.

Intended learning outcomes

Students have developed the ability to approach, analyse and critically interpret current problems in cellular molecular biology based on individually assigned tasks, using techniques of modern molecular and cell biology. They also have developed skills in experimental design, bench work, data analysis and the presentation of scientific results both orally and in writing.

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.

- 03-6S3ZM-1ZM-092: Ü (no information on SWS (weekly contact hours) and course language available)
- 03-6S3ZM-2ZM-092: 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 can be chosen to earn a 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 03-6S3ZM-1ZM-092: Cellular molecular biology 2 (laboratory course)

- 13 ECTS, Method of grading: numerical grade
- a) written examination (approx. 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 (groups of 2 or 3 candidates, approx. 60 minutes) or e) presentation (approx. 20 to 30 minutes)
- Assessment offered: once a year, winter semester
- Language of assessment: German, English

Assessment in module component 03-6S3ZM-2ZM-092: Cellular molecular biology 2 (seminar)

- 2 ECTS, Method of grading: (not) successfully completed
- presentation (approx. 20 to 30 minutes)
- Assessment offered: once a year, winter semester
- Language of assessment: German, English where required

Allocation of places

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Additional information

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Workload

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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 (2007)

Module title			Abbreviation
Cellular Tumour Biology 2			03-S63ZT-092-m01
Module coordinator		**Module offered by**	
Chair of Rudolf Virchow Center for Experimental Biomedicine		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
15	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

Discussing specific problems, this module will impart to students a more in-depth knowledge of tumour biology and will acquaint them with approaches in tumour biology.

Intended learning outcomes

Students have developed the ability to approach, analyse and critically interpret specific problems in tumour biology based on individually assigned tasks, using modern techniques and, in particular, imaging methods. They also have advanced skills in experimental design, bench work, data analysis and the presentation of scientific results.

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

This module comprises 2 module components. Information on courses will be listed separately for each module component.

- 03-S63ZT-1ZT-092: Ü (no information on SWS (weekly contact hours) and course language available)
- 03-S63ZT-2ZT-092: 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 can be chosen to earn a 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 03-S63ZT-1ZT-092: Cellular tumour biology 2 (laboratory course)

- 11 ECTS, Method of grading: numerical grade
- a) written examination (approx. 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 (groups of 2 or 3 candidates, approx. 60 minutes) or e) presentation (approx. 20 to 30 minutes)
- Language of assessment: German or English

Assessment in module component 03-S63ZT-2ZT-092: Cellular tumour biology 2 (seminar)

- 4 ECTS, Method of grading: (not) successfully completed
- presentation (approx. 20 to 30 minutes)
- Language of assessment: German, English where required

Allocation of places

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Additional information

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Workload

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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 (2007)

Module title			Abbreviation
From cells to organisms			07-1A1ZO-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)**	
13	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 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, archaebacteria) 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. Students will also acquire and practise some of the fundamental preparation skills bioscientists are often required to possess.

Intended learning outcomes

- 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. - Fundamental skills in the interpretation of macroscopic and histologic preparations by light microscopy. - Fundamental preparation skills.

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.

- 07-1A1ZO-1Z-072: V + Ü (no information on language and number of weekly contact hours available)
- 07-1A1ZO-2E-072: Ü (no information on language and number of weekly contact hours available)
- 07-1A1ZO-3P-072: V + Ü (no information on language and number of weekly contact hours available)
- 07-1A1ZO-4T-072: V + Ü (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 can be chosen to earn a bonus)

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.

Assessment in module component 07-1A1ZO-1Z-072: Die Zelle (The Cell), **in module component 07-1A1ZO-3P-072:** Das Pflanzenreich (The Plant Kingdom), and **in module component 07-1A1ZO-4T-072:** Das Tierreich (The Animal Kingdom) **:**

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

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Module appears in

Bachelor' degree (1 major) Biology (2007)

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.

- 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 can be chosen to earn a 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

- 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

- 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

- 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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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 (2008)
Bachelor' degree (1 major) Mathematics (2012)
Bachelor' degree (1 major) Mathematics (2013)
Bachelor' degree (1 major) Mathematics (2007)
Bachelor' degree (1 major) Computational Mathematics (2009)
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 (2010)

Module title			Abbreviation
Physiology of Organisms			07-2A2PH-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)**	
9	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 acquaint students with the principles of the general and comparative physiology of organisms and will provide them with an opportunity to develop the fundamental skills for working in a physiological laboratory. The module will first address the biochemistry of the cell and will then move on to discuss prokaryotic metabolic diversity. Subsequently, the module will discuss the physiological processes that regulate the internal environment of multicellular organisms such as plants and 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)

This module comprises 3 module components. Information on courses will be listed separately for each module component.

- 07-2A2PH-1PR-072: V + Ü (no information on SWS (weekly contact hours) and course language available)
- 07-2A2PH-2PF-072: V + Ü (no information on SWS (weekly contact hours) and course language available)
- 07-2A2PH-3TI-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 can be chosen to earn a 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 07-2A2PH-1PR-072: Basic Physiology of Prokaryotes Basic Physiology of Prokaryotes

- 3 ECTS, Method of grading: numerical grade
- written examination (approx. 60 minutes) including multiple choice questions

Assessment in module component 07-2A2PH-2PF-072: Plant Physiology Plant Physiology

- 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 07-2A2PH-3TI-072: Animal Physiology Animal Physiology

- 3 ECTS, Method of grading: numerical grade
- written examination (approx. 60 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

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Additional information

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Workload

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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)

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 can be chosen to earn a 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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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 (2010)

Module title			Abbreviation
Bioinformatics			07-3A3BI-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)**	
2	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

Fundamental principles of bioinformatics.

Intended learning outcomes

Students are proficient in methods for the analysis of DNA and protein databases.

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

This module comprises 2 module components. Information on courses will be listed separately for each module component.

- 07-3A3BI-1B-072: V (no information on SWS (weekly contact hours) and course language available)
- 07-3A3BI-2B-072: 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 can be chosen to earn a 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 07-3A3BI-1B-072: Bioinformatics (Lecture)

- 1 ECTS, Method of grading: numerical grade
- written examination (approx. 20 minutes)

Assessment in module component 07-3A3BI-2B-072: Bioinformatics (Seminar)

- 1 ECTS, Method of grading: (not) successfully completed
- term paper (approx. 5 to 10 pages)

Allocation of places

Only as part of Biochemistry Master's: 5 places. Places will be allocated by lot.

Additional information

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Workload

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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 (2007)
Bachelor' degree (1 major) Mathematics (2008)
Bachelor' degree (1 major) Mathematics (2007)
Bachelor' degree (1 major) Computational Mathematics (2009)
Master's degree (1 major) Biochemistry (2012)
Bachelor's degree (1 major, 1 minor) Biology (Minor, 2008)

Module title			Abbreviation
Biotechnology			07-3A3BT-072-m01
Module coordinator		**Module offered by**	
holder of the Chair of Biotechnology and Biophysics		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
2	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

This module will provide students with an overview of topics in biotechnology: biosensors and environmental biotechnology, microbiotechnology and nanobiotechnology, biomaterials, cryobiotechnology, bioprocess engineering and microbial biotechnology.

Intended learning outcomes

Students have become familiar with the fundamental principles of biotechnology.

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 can be chosen to earn a bonus)

written examination (30 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)
Bachelor's degree (1 major, 1 minor) Biology (Minor, 2008)

Module title			Abbreviation
Developmental Biology of Plants and Animals			07-3A3EBIO-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)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

In this module, students will acquire an overview of the theoretical and practical fundamentals of animal and plant developmental biology.

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)

This module comprises 2 module components. Information on courses will be listed separately for each module component.

- 07-3A3EBIO-1T-072: V + Ü (no information on SWS (weekly contact hours) and course language available)
- 07-3A3EBIO-2P-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 can be chosen to earn a 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 07-3A3EBIO-1T-072: Developmental Biology of Animals (Lecture and Experimental Course) Developmental Biology of Animals (Lecture and Experimental Course)

- 5 ECTS, Method of grading: numerical grade
- written examination (60 minutes)

Assessment in module component 07-3A3EBIO-2P-072: Developmental Biology of Plants (Lecture and experimental course) (Lecture and Experimental Course) Developmental Biology of Plants (Lecture and experimental course) (Lecture and Experimental Course)

- 5 ECTS, Method of grading: numerical grade
- written examination (60 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)
Bachelor's degree (1 major, 1 minor) Biology (Minor, 2008)

Module title			Abbreviation
Genetics			07-3A3GE-072-m01
Module coordinator		**Module offered by**	
holder of the Chair of Neurobiology and Genetics		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
2	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

Molecular and classical genetics.

Intended learning outcomes

Students are familiar with the mechanisms of inheritance that are essential for developing an understanding of biology as a whole.

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 can be chosen to earn a bonus)

written examination (30 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)
Bachelor' degree (1 major) Mathematics (2008)
Bachelor' degree (1 major) Mathematics (2007)
Bachelor' degree (1 major) Computational Mathematics (2009)

Module title			Abbreviation
Ecology of plants and animals			07-3A30E-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	--	

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.

- 07-3A30E-1T-072: V + Ü (no information on SWS (weekly contact hours) and course language available)
- 07-3A30E-2P-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 can be chosen to earn a 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 07-3A30E-1T-072: Ecology of Animals (Lecture and Practice) Ecology of Animals (Lecture and Practice)

- 3 ECTS, Method of grading: numerical grade
- written examination (45 minutes)

Assessment in module component 07-3A30E-2P-072: Ecology of Plant (Lecture and Practice) Ecology of Plant (Lecture and Practice)

- 3 ECTS, Method of grading: numerical grade
- written examination (60 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)
Bachelor' degree (1 major) Mathematics (2008)

Bachelor' degree (1 major) Mathematics (2007)
Bachelor' degree (1 major) Computational Mathematics (2009)

Module title			Abbreviation
Pharmaceutical Biology			07-3A3PB-072-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)**	
2	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

In this module, students will acquire an overview of the study of biogenic drugs. The module will include an introduction to one branch: pharmacokinetics, the discipline that describes the fate of a drug or xenobiotic in an organism.

Intended learning outcomes

Students have become familiar with the fundamental principles of pharmacokinetics.

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 can be chosen to earn a bonus)

written examination (30 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)
Bachelor's degree (1 major, 1 minor) Biology (Minor, 2008)

Module title			Abbreviation
Local Fauna			07-4A4FA-072-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	--	

Contents

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.

Intended learning outcomes

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.

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.

- 07-4A4FA-1FA-072: V + Ü (no information on SWS (weekly contact hours) and course language available)
- 07-4A4FA-2FA-072: 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 can be chosen to earn a 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 07-4A4FA-1FA-072: Fauna (Lecture, Practice on Systematic) Fauna (Lecture, Practice on Systematic)

- 4 ECTS, Method of grading: numerical grade
- written examination (45 minutes) and practical identification assignment (45 minutes); weighted 1:1

Assessment in module component 07-4A4FA-2FA-072: Fauna Field Excursions

- 3 ECTS, Method of grading: (not) successfully completed
- log (approx. 1 to 2 pages) and presentation (approx. 10 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)

Bachelor's degree (1 major, 1 minor) Biology (Minor, 2008)

Module title			Abbreviation
Local Flora			07-4A4FL-072-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	--	

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 *Flora von Deutschland* 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.

- 07-4A4FL-1FL-072: V + Ü (no information on SWS (weekly contact hours) and course language available)
- 07-4A4FL-2FL-072: 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 can be chosen to earn a 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-1FL-072: Flora (Lecture, Practice on Systematic) Flora (Lecture, Practice on Systematic)

- 4 ECTS, Method of grading: numerical grade
- written examination (45 minutes) and practical identification assignment (60 minutes); weighted 1:1

Assessment in module component 07-4A4FL-2FL-072: Flora Field Excursions

- 3 ECTS, Method of grading: (not) successfully completed
- log (approx. 1 to 2 pages) and presentation (approx. 10 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007) Bachelor' degree (1 major) Geography (2008) Bachelor's degree (1 major, 1 minor) Biology (Minor, 2008)

Module title			Abbreviation
Developmental Biology for advanced students			07-4BFMZ1-092-m01
Module coordinator		**Module offered by**	
holder of the Chair of Cell Biology and Developmental 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	--	

Contents

This module will acquaint students with the fundamental principles of the molecular developmental biology of animals. Particular emphasis will be placed on providing students with an opportunity to become proficient in fundamental methods and applications, using the help of examples.

Intended learning outcomes

Students are able to use fundamental methods to approach simple problems in animal developmental biology.

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 can be chosen to earn a bonus)

a) written examination (approx. 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 (groups of up to 3 candidates, approx. 60 minutes) or e) presentation (approx. 20 to 30 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)
Bachelor' degree (1 major) Mathematics (2007)

Module title			Abbreviation
Cell Biology for advanced students			07-4BFMZ2-092-m01
Module coordinator		**Module offered by**	
holder of the Chair of Cell Biology and Developmental 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	--	

Contents

This module will acquaint students with the fundamental principles of cell biology. Particular emphasis will be placed on providing students with an opportunity to become proficient in fundamental methods and applications in molecular and cell biology, using the help of examples.

Intended learning outcomes

Students are able to use fundamental methods to approach simple problems in cell biology.

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 can be chosen to earn a bonus)

written examination (60 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)
Bachelor' degree (1 major) Mathematics (2007)

Module title			Abbreviation
Microbiology for advanced students			07-4BFMZ3-092-m01
Module coordinator		**Module offered by**	
holder of the Chair of Microbiology		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

This module will acquaint students with the fundamental principles of the physiology and molecular biology of microorganisms.

Intended learning outcomes

Students are able to use fundamental methods to approach simple problems in microbiology. They are familiar with topics in microbiology.

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

V + 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 can be chosen to earn a bonus)

written examination (60 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)
Bachelor' degree (1 major) Mathematics (2007)

Module title			Abbreviation
Bioinformatics for advanced students			07-4BFMZ4-092-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	--	

Contents

The module will introduce students to the practice of bioinformatics and will cover the following topics: sequence analysis, structure analysis, genome analysis, cellular and metabolic networks as well as gene regulation.

Intended learning outcomes

Students are able to use appropriate bioinformatic algorithms to address simple problems as well as to interpret their 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 can be chosen to earn a bonus)

log (approx. 10 to 20 pages)

Allocation of places

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Additional information

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Workload

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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 (2007)
Bachelor' degree (1 major) Mathematics (2008)
Bachelor' degree (1 major) Mathematics (2007)
Bachelor' degree (1 major) Computational Mathematics (2009)

Module title			Abbreviation
Biotechnology I			07-4BFMZ5-092-m01
Module coordinator		**Module offered by**	
holder of the Chair of Biotechnology 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	--	

Contents

During this practical course, students will acquire an insight into a variety of topics in biotechnology.

Intended learning outcomes

Students are able to apply advanced methods in biotechnology.

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.

- 07-4BFMZ5-1BT-092: P (no information on SWS (weekly contact hours) and course language available)
- 07-4BFMZ5-2BT-092: 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 can be chosen to earn a 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 07-4BFMZ5-1BT-092: Biotechnology 1 (Lecture and Laboratory Practice)

- 4 ECTS, Method of grading: numerical grade
- log (approx. 10 to 20 pages)
- Assessment offered: once a year, summer semester

Assessment in module component 07-4BFMZ5-2BT-092: Seminar to Advanced Biotechnology 1

- 1 ECTS, Method of grading: (not) successfully completed
- presentation (approx. 20 to 30 minutes)
- Assessment offered: once a year, summer semester

Allocation of places

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Additional information

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Workload

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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 (2007)
Bachelor' degree (1 major) Mathematics (2007)

Module title			Abbreviation
Neurobiology for advanced students			07-4BFNVO1-092-m01
Module coordinator		**Module offered by**	
holder of the Chair of Neurobiology and 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	--	

Contents

Fundamental principles of neurobiology. How do the brain, neurons and genes control behaviour? Cellular and molecular foundations of the function of neurons. Synaptic transmission. Applications of neurobiology.

Intended learning outcomes

Students have acquired an advanced knowledge in the area of neurobiology and recognise the relevance research findings in neurobiology have to medicine.

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 can be chosen to earn a bonus)

written examination (60 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)
Bachelor' degree (1 major) Mathematics (2007)

Module title			Abbreviation
Behavioural physiology and sociobiology for advanced students			07-4BFNVO2-092-m01
Module coordinator		**Module offered by**	
holder of the Chair of Neurobiology and 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	--	

Contents

Specific and comparative animal physiology with a focus on neurophysiology as well as sensory and behavioural physiology.

Intended learning outcomes

Students have acquired knowledge and skills in the area of specific animal physiology. They are familiar with hypotheses and are proficient in methods used in research in this field.

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 can be chosen to earn a bonus)

written examination (60 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)
Bachelor' degree (1 major) Mathematics (2007)

Module title			Abbreviation
Ecology of Animals for advanced students			07-4BFNV03-092-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	--	

Contents

Selected topics in autecology and synecology; experimental design, data collection and analysis in animal ecology.

Intended learning outcomes

Students have acquired an advanced knowledge in the area of animal ecology. They are able to design simple ecological lab and field experiments as well as to interpret and present their findings.

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 can be chosen to earn a bonus)

written examination (60 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)
Bachelor' degree (1 major) Mathematics (2008)
Bachelor' degree (1 major) Mathematics (2007)
Bachelor' degree (1 major) Computational Mathematics (2009)

Module title			Abbreviation
Specific Plant Physiology			07-4BFPS1-092-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	--	

Contents

This module will equip students with the theoretical foundations of fundamental processes in plants, such as nitrogen and carbon metabolism. The methodological approaches in experimental plant physiology will be discussed and the molecular techniques for functional gene analysis (reverse genetics and other techniques) will be applied.

Intended learning outcomes

Students have acquired fundamental knowledge on plant nutrient cycles and are proficient in molecular and physiological methods in experimental plant physiology.

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 can be chosen to earn a bonus)

written examination (60 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)
Bachelor' degree (1 major) Mathematics (2007)

Module title			Abbreviation
Biophysics - Basic course			07-4BFPS2-092-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	--	

Contents

In this module, students will acquire the general fundamentals of plant membrane transport and the biophysical methods with which it can be characterised. For this purpose, students will be introduced to modern methods of molecular biology and imaging as well as data collection and analysis.

Intended learning outcomes

Students understand basic membrane transport processes and are able to use experimental methods in experiments with intact plants, isolated plant cells as well as animal expression 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 can be chosen to earn a bonus)

written examination (60 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)
Bachelor' degree (1 major) Mathematics (2008)
Bachelor' degree (1 major) Mathematics (2007)
Bachelor' degree (1 major) Computational Mathematics (2009)

Module title			Abbreviation
Biochemistry - Basic course			07-4BFPS3-092-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	--	

Contents

In this module, students will become acquainted with the most important plant, biological and microbial photoreceptors and will learn the fundamental principles of the biochemical and molecular biological methods for the expression, isolation and purification as well as the biophysical characterisation of receptors.

Intended learning outcomes

Students are familiar with the biochemistry, molecular biology and function of biological photoreceptors and are able to analyse these using appropriate 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 can be chosen to earn a bonus)

written examination (60 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)
Bachelor' degree (1 major) Mathematics (2007)

Module title			Abbreviation
Basics plant Ecophysiology			07-4BFPS4-092-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)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

Using the examples of selected systems, this module will introduce students to the theoretical fundamentals of the interaction between plants and their environment and will make students familiar with the molecular biological, chemical analytical as well as ecophysiological methods necessary to investigate this interaction.

Intended learning outcomes

Students will be able to recognise, describe and evaluate interactions between plants and their environment. They will be able to perform basic experiments to analyse these interactions.

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 can be chosen to earn a bonus)

written examination (60 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)
Bachelor' degree (1 major) Mathematics (2007)

Module title			Abbreviation
Pharmaceutical bio analytics			07-4BFPS5-092-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	--	

Contents

In this module, students will acquire the theoretical and methodological fundamentals of drug and metabolite analysis. It will include an introduction to chromatographic methods of analysis as well as modern methods in computational chemistry. Qualitative and quantitative analyses of active agents and metabolites will be performed on, for example, complex drug, plant and urine samples.

Intended learning outcomes

Students have developed fundamental knowledge and skills in the area of drug and metabolite analysis and are proficient in chromatographic methods.

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.

- 07-4BFPS5-1BA-092: P (no information on SWS (weekly contact hours) and course language available)
- 07-4BFPS5-2BA-092: 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 can be chosen to earn a 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 07-4BFPS5-1BA-092: Pharmaceutical Bioanalytics (practical course)

- 4 ECTS, Method of grading: numerical grade
- written examination (45 minutes)

Assessment in module component 07-4BFPS5-2BA-092: Seminar Pharmaceutical Bio Analytics

- 1 ECTS, Method of grading: (not) successfully completed
- presentation (approx. 20 to 30 minutes)
- Assessment offered: once a year, summer semester

Allocation of places

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Additional information

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Workload

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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 (2007)
Bachelor' degree (1 major) Mathematics (2007)

Module title			Abbreviation
Advanced Light- and Electron-Microscopy			07-4S1MZ1-092-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)**	
3	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

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 can be chosen to earn a bonus)

written examination (45 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)
Bachelor' degree (1 major) Mathematics (2007)
Bachelor's degree (1 major, 1 minor) Biology (Minor, 2008)

Module title			Abbreviation
Analysis of Chromosomes			07-4S1MZ2-092-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)**	
3	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

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 can be chosen to earn a bonus)

written examination (45 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)
Bachelor' degree (1 major) Mathematics (2007)
Bachelor's degree (1 major, 1 minor) Biology (Minor, 2008)

Module title			Abbreviation
Ecology and Developmental Biology of marine organisms			07-4S1MZ3-092-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	By way of exception, additional prerequisites are listed in the section on assessments.	

Contents

A combination of lab work and field trips, this module will provide students with an insight both into the organismal diversity of a marine ecosystem and into the biocenosis of the littoral of the island of Helgoland in the North Sea.

Intended learning outcomes

Students are familiar with the morphology, developmental biology, physiology and ecology of organisms in a marine ecosystem.

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.

- 07-4S1MZ3-1MO-092: Ü (no information on SWS (weekly contact hours) and course language available)
- 07-4S1MZ3-2MO-092: 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 can be chosen to earn a 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 07-4S1MZ3-1MO-092: Ecology and Developmental Biology of Marine Organisms

- 4 ECTS, Method of grading: numerical grade
- log (approx. 10 to 20 pages)
- Assessment offered: once a year, summer semester
- 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 07-4S1MZ3-2MO-092: Seminar on Marine Biology

- 1 ECTS, Method of grading: (not) successfully completed
- presentation (approx. 20 to 30 minutes)
- Assessment offered: once a year, summer semester

Allocation of places

Information on the allocation of places will be listed separately for each module component.

- 07-4S1MZ3-1MO-092: 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.

- 07-4S1MZ3-2MO-092: --

Additional information

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Workload

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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 (2007)
Bachelor' degree (1 major) Biology (2010)
Bachelor' degree (1 major) Mathematics (2007)
Bachelor's degree (1 major, 1 minor) Biology (Minor, 2008)
First state examination for the teaching degree Grundschule Biology (2009)
First state examination for the teaching degree Hauptschule Biology (2009)
First state examination for the teaching degree Realschule Biology (2009)
First state examination for the teaching degree Gymnasium Biology (2009)
First state examination for the teaching degree Mittelschule Biology (2013)

Module title			Abbreviation
Methods in Biotechnology			07-4S1MZ4-092-m01
Module coordinator		**Module offered by**	
holder of the Chair of Biotechnology and Biophysics		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
2	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

This module will provide students with an overview of instrument-based methods in biotechnology and biomedicine. In particular, imaging methods as well as single-cell technologies will be discussed. Publications on the methodology of biotechnology will be analysed.

Intended learning outcomes

Students are able to select the instrument-based method in biotechnology and biomedicine that is appropriate to a particular problem.

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.

- 07-4S1MZ4-1AB-092: V (no information on SWS (weekly contact hours) and course language available)
- 07-4S1MZ4-2AB-092: 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 can be chosen to earn a 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 07-4S1MZ4-1AB-092: Methods in Biotechnology (Lecture)

- 1 ECTS, Method of grading: numerical grade
- written examination (20 minutes)

Assessment in module component 07-4S1MZ4-2AB-092: Seminar on Methods in Biotechnology

- 1 ECTS, Method of grading: (not) successfully completed
- presentation (approx. 20 to 30 minutes)
- Assessment offered: once a year, summer semester

Allocation of places

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Additional information

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Workload

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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 (2007)
Bachelor' degree (1 major) Mathematics (2007)

Module title			Abbreviation
Aspects of modern Biotechnology			07-4S1MZ5-092-m01
Module coordinator		**Module offered by**	
holder of the Chair of Biotechnology and Biophysics		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
2	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

Theoretical aspects of modern molecular biotechnology.

Intended learning outcomes

Students have acquired knowledge and skills in the area of molecular biotechnology.

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.

- 07-4S1MZ5-1MB-092: V (no information on SWS (weekly contact hours) and course language available)
- 07-4S1MZ5-2MB-092: 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 can be chosen to earn a 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 07-4S1MZ5-1MB-092: Aspects of Modern Biotechnology (Lecture)

- 1 ECTS, Method of grading: numerical grade
- written examination (20 minutes)

Assessment in module component 07-4S1MZ5-2MB-092: Seminar on Molecular Biotechnology

- 1 ECTS, Method of grading: (not) successfully completed
- presentation (approx. 20 to 30 minutes)
- Assessment offered: once a year, summer semester

Allocation of places

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Additional information

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Workload

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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 (2007)
Bachelor' degree (1 major) Mathematics (2007)

Module title			Abbreviation
Special Bioinformatics I			07-4S1MZ6-092-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	--	

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 can be chosen to earn a bonus)

log (approx. 10 to 20 pages)

Allocation of places

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Additional information

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Workload

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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 (2007)
Bachelor' degree (1 major) Mathematics (2008)
Bachelor' degree (1 major) Mathematics (2007)
Bachelor' degree (1 major) Computational Mathematics (2009)
Bachelor's degree (1 major, 1 minor) Biology (Minor, 2008)

Module title			Abbreviation
Neurobiology I			07-4S1NVO1-092-m01
Module coordinator		**Module offered by**	
holder of the Chair of Neurobiology and 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	--	

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 can be chosen to earn a bonus)

log (approx. 10 to 20 pages)

Allocation of places

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Additional information

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Workload

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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 (2007)
Bachelor' degree (1 major) Mathematics (2008)
Bachelor' degree (1 major) Mathematics (2007)
Bachelor' degree (1 major) Computational Mathematics (2009)
Bachelor's degree (1 major, 1 minor) Biology (Minor, 2008)

Module title			Abbreviation
Aspects of Integrative Behavioural Biology			07-4S1NVO2-092-m01
Module coordinator		**Module offered by**	
holder of the Chair of Zoology II		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	By way of exception, additional prerequisites are listed in the section on assessments.	

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)

This module comprises 2 module components. Information on courses will be listed separately for each module component.

- 07-4S1NVO2-1IV-092: V (no information on SWS (weekly contact hours) and course language available)
- 07-4S1NVO2-2IV-092: 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 can be chosen to earn a 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 07-4S1NVO2-1IV-092: Aspects of Integrative Behavioural Biology 1 (Lecture and Practice)

- 2 ECTS, Method of grading: numerical grade
- written examination (30 minutes)
- Language of assessment: German or English
- Other prerequisites: A good command of the English language is recommended.

Assessment in module component 07-4S1NVO2-2IV-092: Current Topics in Behavioural Biology

- 3 ECTS, Method of grading: (not) successfully completed
- presentation (approx. 20 to 30 minutes)
- Assessment offered: once a year, summer semester
- Language of assessment: German or English
- Other prerequisites: A good command of the English language is recommended.

Allocation of places

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Additional information

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Workload

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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 (2007)

Bachelor' degree (1 major) Mathematics (2007)
Bachelor's degree (1 major, 1 minor) Biology (Minor, 2008)

Module title			Abbreviation
Functional Morphology of arthropods			07-4S1NV03-092-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 can be chosen to earn a 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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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
Ecology of insects			07-4S1NVO4-092-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	--	

Contents

Taxonomy, ecology (synecology in particular) and behavioural biology of insects, including experimental field and lab work.

Intended learning outcomes

Students are proficient in insect diagnostics and are able to apply appropriate methods for experiments on insect ecology and behavioural biology.

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 can be chosen to earn a bonus)

written examination (60 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)
Bachelor' degree (1 major) Mathematics (2007)
Bachelor's degree (1 major, 1 minor) Biology (Minor, 2008)

Module title			Abbreviation
Ecology of populations			07-4S1NVO5-092-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	--	

Contents

More in-depth discussion of the structure and dynamics of human and animal populations; regulation of population density; management.

Intended learning outcomes

Students are able to interpret the structure and dynamics of populations and metapopulations on the basis of model concepts in population ecology and to apply more advanced methods of quantitative analysis to these.

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.

- 07-4S1NVO5-1PO-092: V + Ü (no information on SWS (weekly contact hours) and course language available)
- 07-4S1NVO5-2PO-092: 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 can be chosen to earn a 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 07-4S1NVO5-1PO-092: Basic Ecology of Populations (Lecture, Practice) Basic Ecology of Populations (Lecture, Practice)

- 4 ECTS, Method of grading: numerical grade
- written examination (45 minutes)

Assessment in module component 07-4S1NVO5-2PO-092: Ecology of Populations (Seminar)

- 1 ECTS, Method of grading: (not) successfully completed
- presentation (approx. 20 to 30 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)
Bachelor' degree (1 major) Mathematics (2008)
Bachelor' degree (1 major) Mathematics (2007)
Bachelor' degree (1 major) Computational Mathematics (2009)
Bachelor's degree (1 major, 1 minor) Biology (Minor, 2008)

Module title			Abbreviation
Molecular modelling - From DNA to protein			07-4S1PS1-092-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	--	

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 can be chosen to earn a bonus)

computerised practical examination (4 hours)

Allocation of places

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Additional information

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Workload

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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 (2007)
Bachelor' degree (1 major) Mathematics (2008)
Bachelor' degree (1 major) Mathematics (2007)
Bachelor' degree (1 major) Computational Mathematics (2009)
Bachelor's degree (1 major, 1 minor) Biology (Minor, 2008)

Module title			Abbreviation
Introduction Methods in Plant Ecophysiology			07-4S1PS2-092-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	--	

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)

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 can be chosen to earn a bonus)

log (approx. 10 to 20 pages)

Allocation of places

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Additional information

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Workload

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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 (2007)
Bachelor' degree (1 major) Mathematics (2007)
Bachelor's degree (1 major, 1 minor) Biology (Minor, 2008)

Module title			Abbreviation
Pharmaceutical Drugs			07-4S1PS3-092-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	--	

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)

This module comprises 2 module components. Information on courses will be listed separately for each module component.

- 07-4S1PS3-1PD-092: Ü (no information on SWS (weekly contact hours) and course language available)
- 07-4S1PS3-2PD-092: 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 can be chosen to earn a 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 07-4S1PS3-1PD-092: Pharmaceutical Drugs (Laboratory Course)

- 3 ECTS, Method of grading: numerical grade
- written examination (45 minutes)

Assessment in module component 07-4S1PS3-2PD-092: Seminar on Pharmaceutical Drugs

- 2 ECTS, Method of grading: (not) successfully completed
- presentation (approx. 20 to 30 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)
Bachelor' degree (1 major) Mathematics (2007)
Bachelor's degree (1 major, 1 minor) Biology (Minor, 2008)

Module title			Abbreviation
Methods Pharmaceutical Biology - practical course			07-4S1PS4-092-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	--	

Contents

This module will provide students with a theoretical and methodological introduction to fundamental techniques in molecular biology and drug analysis.

Intended learning outcomes

Students are able to analyse groups of drugs, using a variety of methods.

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.

- 07-4S1PS4-1PB-092: P (no information on SWS (weekly contact hours) and course language available)
- 07-4S1PS4-2PB-092: 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 can be chosen to earn a 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 07-4S1PS4-1PB-092: Analytics and Molecular Biology of Pharmaceutical Drugs (Laboratory Course)

- 4 ECTS, Method of grading: numerical grade
- written examination (45 minutes)

Assessment in module component 07-4S1PS4-2PB-092: Seminar on Analytics and Molecular Biology of Pharmaceutical Drugs

- 1 ECTS, Method of grading: (not) successfully completed
- presentation (approx. 20 to 30 minutes)
- Assessment offered: once a year, winter semester

Allocation of places

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Additional information

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Workload

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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 (2007)
Bachelor' degree (1 major) Mathematics (2007)
Bachelor's degree (1 major, 1 minor) Biology (Minor, 2008)

Module title			Abbreviation
Practical Course as exchange student			07-5AP-072-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	--	

Contents

Practical course to be completed at universities abroad. Students may complete this course in the context of exchange programmes such as Erasmus etc. Contents of the course should correspond to the contents of *Spezielle Biowissenschaften 2* (*Advanced Biosciences 2*); please consult with the competent coordinator in advance.

Intended learning outcomes

Students are familiar with working methods at universities in countries other than Germany. They have developed professional competencies as well as language and interpersonal skills.

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 can be chosen to earn a bonus)

a) written examination (approx. 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 (groups of up to 3 candidates, approx. 60 minutes) or e) presentation (approx. 20 to 30 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)
Bachelor' degree (1 major) Mathematics (2007)

Module title			Abbreviation
External Practical Course			07-5EP-072-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	--	

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 can be chosen to earn a bonus)

a) written examination (approx. 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 (groups of up to 3 candidates, approx. 60 minutes) or e) presentation (approx. 20 to 30 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)
Bachelor' degree (1 major) Mathematics (2007)

Module title			Abbreviation
Methods in molecular cell - and developmental Biology			07-5S2MZ1-092-m01
Module coordinator		**Module offered by**	
holder of the Chair of Zoology I		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	--	

Contents

In this module, students will acquire an in-depth insight into approaches and methods in molecular and cell biology.

Intended learning outcomes

Students have acquired knowledge about general strategies and methods of molecular and cell biology. They are able to independently perform scientific laboratory work.

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.

- 07-5S2MZ1-1ZE-092: V + Ü (no information on SWS (weekly contact hours) and course language available)
- 07-5S2MZ1-2ZE-092: Ü (no information on SWS (weekly contact hours) and course language available)
- 07-5S2MZ1-3ZE-092: 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 can be chosen to earn a 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 07-5S2MZ1-1ZE-092: Methods in molecular cell - and developmental Biology - Data processing and computer skills (lecture and practice) Methods in molecular cell - and developmental Biology - Data processing and computer skills (lecture and practice)

- 3 ECTS, Method of grading: numerical grade
- a) written examination (approx. 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 (groups of 2 or 3 candidates, approx. 60 minutes) or e) presentation (approx. 20 to 30 minutes)
- Language of assessment: German or English

Assessment in module component 07-5S2MZ1-2ZE-092: Methods in molecular cell - and developmental Biology (laboratory course)

- 6 ECTS, Method of grading: numerical grade
- a) written examination (approx. 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 (groups of 2 or 3 candidates, approx. 60 minutes) or e) presentation (approx. 20 to 30 minutes)
- Language of assessment: German, English

Assessment in module component 07-5S2MZ1-3ZE-092: Current topics in molecular cell - and developmental Biology (seminar)

- 1 ECTS, Method of grading: (not) successfully completed
- presentation (approx. 20 to 30 minutes)

Allocation of places

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Additional information

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Workload
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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 (2007) Bachelor' degree (1 major) Mathematics (2007)

Module title			Abbreviation
Specific Microbiology II			07-5S2MZ2-092-m01
Module coordinator		**Module offered by**	
holder of the Chair of Microbiology		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	--	

Contents

In this module, students will acquire an in-depth insight into approaches and methods in microbiology.

Intended learning outcomes

Students have acquired knowledge about general strategies and methods of microbiology. They are able to independently perform scientific laboratory work.

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.

- 07-5S2MZ2-1MI-092: V + Ü (no information on SWS (weekly contact hours) and course language available)
- 07-5S2MZ2-2MI-092: 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 can be chosen to earn a 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 07-5S2MZ2-1MI-092: Specific microbiology 2 - molecular microbiology (lecture and laboratory course) Specific microbiology 2 - molecular microbiology (lecture and laboratory course)

- 7 ECTS, Method of grading: numerical grade
- a) written examination (approx. 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 (groups of 2 or 3 candidates, approx. 60 minutes) or e) presentation (approx. 20 to 30 minutes)
- Language of assessment: German or English

Assessment in module component 07-5S2MZ2-2MI-092: Advanced microbiology 2 - Seminar in molecular microbiology

- 3 ECTS, Method of grading: (not) successfully completed
- presentation (approx. 20 to 30 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)
Bachelor' degree (1 major) Mathematics (2007)

Module title			Abbreviation
Specific Bioinformatics II			07-5S2MZ3-092-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)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

The module will cover two topics from the area of bioinformatics to be selected from the following list: - sequence analysis, phylogenetics and evolution - gene expression profiling - protein structure analysis - programming for bioinformatics - network analysis

Intended learning outcomes

Students have acquired knowledge about general strategies and methods of bioinformatics. They are able to independently perform scientific laboratory work.

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 can be chosen to earn a bonus)

a) written examination (approx. 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 (groups of up to 3 candidates, approx. 60 minutes) or e) presentation (approx. 20 to 30 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)
Bachelor' degree (1 major) Mathematics (2008)
Bachelor' degree (1 major) Mathematics (2007)
Bachelor' degree (1 major) Computational Mathematics (2009)

Module title			Abbreviation
Specific Biotechnology II			07-5S2MZ4-092-m01
Module coordinator		**Module offered by**	
holder of the Chair of Biotechnology and Biophysics		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	--	

Contents

In this module, students will acquire an in-depth insight into approaches and methods in biotechnology.

Intended learning outcomes

Students have acquired knowledge about general strategies and methods of biotechnology. They are able to independently perform scientific laboratory work.

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.

- 07-5S2MZ4-1BT-092: P (no information on SWS (weekly contact hours) and course language available)
- 07-5S2MZ4-2BT-092: 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 can be chosen to earn a 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 07-5S2MZ4-1BT-092: Specific Biotechnology 2 - Practical Biotechnology 2 (laboratory course)

- 8 ECTS, Method of grading: numerical grade
- a) written examination (approx. 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 (groups of 2 or 3 candidates, approx. 60 minutes) or e) presentation (approx. 20 to 30 minutes)
- Language of assessment: German or English

Assessment in module component 07-5S2MZ4-2BT-092: Specific Biotechnology 2 - Seminar Biotechnology 2

- 2 ECTS, Method of grading: (not) successfully completed
- presentation (approx. 20 to 30 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)
Bachelor' degree (1 major) Mathematics (2007)

Module title			Abbreviation
Neurobiology II			07-5S2NVO1-092-m01
Module coordinator		**Module offered by**	
holder of the Chair of Neurobiology and Genetics		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	--	

Contents

This module will provide students with deeper insights into the following topics: the neuronal bases of cognition, sensory systems, learning and memory.

Intended learning outcomes

Students are able to acquaint themselves with and deliver presentations on advanced topics in neurobiology, taking into account current literature.

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.

- 07-5S2NVO1-1NB-092: V + Ü (no information on SWS (weekly contact hours) and course language available)
- 07-5S2NVO1-2NB-092: 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 can be chosen to earn a 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 07-5S2NVO1-1NB-092: Neurobiology 2 (lecture and practical course) Neurobiology 2 (lecture and practical course)

- 7 ECTS, Method of grading: numerical grade
- a) written examination (approx. 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 (groups of 2 or 3 candidates, approx. 60 minutes) or e) presentation (approx. 20 to 30 minutes)
- Language of assessment: German or English

Assessment in module component 07-5S2NVO1-2NB-092: Neurobiology 2 (seminar)

- 3 ECTS, Method of grading: (not) successfully completed
- presentation (approx. 20 to 30 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)
Bachelor' degree (1 major) Mathematics (2007)

Module title			Abbreviation
Integrative Behavioural Biology II			07-5S2NVO2-092-m01
Module coordinator		**Module offered by**	
holder of the Chair of Zoology II		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	--	

Contents

In this module, students will acquire an in-depth insight into behavioural physiology and sociobiology with a particular focus on the biology of social insects.

Intended learning outcomes

Students have acquired knowledge and skills in the areas of behavioural physiology and sociobiology. They are familiar with hypotheses and are proficient in methods used in research on social insects.

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

V + 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 can be chosen to earn a bonus)

a) written examination (approx. 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 (groups of up to 3 candidates, approx. 60 minutes) or e) presentation (approx. 20 to 30 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)
Bachelor' degree (1 major) Mathematics (2007)

Module title			Abbreviation
Ecology of animals II			07-5S2NV03-092-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)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

In this module, students will acquire an in-depth insight into experiment design and the statistical analysis of data in animal ecology.

Intended learning outcomes

Students are able to design appropriate experiments to address a scientific issue as well as to analyse, present and interpret the results.

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

This module comprises 2 module components. Information on courses will be listed separately for each module component.

- 07-5S2NV03-1OE-092: V + Ü (no information on SWS (weekly contact hours) and course language available)
- 07-5S2NV03-2OE-092: 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 can be chosen to earn a 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 07-5S2NV03-1OE-092: Ecology of Animals 2 - Planning of experiments and Statistics (lecture and practice) Ecology of Animals 2 - Planning of experiments and Statistics (lecture and practice)

- 9 ECTS, Method of grading: numerical grade
- a) written examination (approx. 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 (groups of 2 or 3 candidates, approx. 60 minutes) or e) presentation (approx. 20 to 30 minutes)
- Language of assessment: German or English

Assessment in module component 07-5S2NV03-2OE-092: Ecology of Animals 2 - Analysis of ecological data (seminar)

- 1 ECTS, Method of grading: (not) successfully completed
- presentation (approx. 20 to 30 minutes)
- Assessment offered: once a year, winter semester

Allocation of places

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Additional information

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Workload

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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 (2007)

Bachelor' degree (1 major) Mathematics (2007)

Module title			Abbreviation
Physiology of membrane transport mechanisms			07-5S2PS1-092-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)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

The module will address topics in contemporary research on plant membrane transport with modern molecular biological and biophysical methods. On the basis of current scientific publications, different aspects of plant physiology will be presented and discussed in English.

Intended learning outcomes

Students are familiar with current research in the field of plant membrane transport as well as with the methods used. They are able to interpret and deliver presentations on scientific publications.

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.

- 07-5S2PS1-1MT-092: Ü (no information on SWS (weekly contact hours) and course language available)
- 07-5S2PS1-2MT-092: 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 can be chosen to earn a 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 07-5S2PS1-1MT-092: Physiology of membrane transport mechanisms (laboratory course)

- 9 ECTS, Method of grading: numerical grade
- a) written examination (approx. 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 (groups of 2 or 3 candidates, approx. 60 minutes) or e) presentation (approx. 20 to 30 minutes)
- Language of assessment: German or English

Assessment in module component 07-5S2PS1-2MT-092: Physiology of membrane transport mechanisms - Progress in plant physiology (seminar)

- 1 ECTS, Method of grading: (not) successfully completed
- presentation (approx. 20 to 30 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)
Bachelor' degree (1 major) Mathematics (2007)

Module title			Abbreviation
Molecular biology of plants			07-5S2PS2-092-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)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

In this module, students will acquire advanced knowledge and skills in techniques of molecular biology for questions of plant physiology. Every student will perform a physiological experiment that will be analysed using the methods the students have learned. Current scientific publications in the field of plant physiology will be presented and discussed in English.

Intended learning outcomes

Students are able to perform advanced experiments in plant physiology as well as to interpret and deliver presentations on scientific publications.

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.

- 07-5S2PS2-1MP-092: Ü (no information on SWS (weekly contact hours) and course language available)
- 07-5S2PS2-2MP-092: 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 can be chosen to earn a 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 07-5S2PS2-1MP-092: Molecular Biology of plants (laboratory course)

- 9 ECTS, Method of grading: numerical grade
- a) written examination (approx. 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 (groups of 2 or 3 candidates, approx. 60 minutes) or e) presentation (approx. 20 to 30 minutes)
- Language of assessment: German or English

Assessment in module component 07-5S2PS2-2MP-092: Molecular Biology of plants - Progress in plant physiology (seminar)

- 1 ECTS, Method of grading: (not) successfully completed
- presentation (approx. 20 to 30 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)
Bachelor' degree (1 major) Mathematics (2007)

Module title			Abbreviation
Protein biochemistry and expression of recombinant proteins			07-5S2PS3-092-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)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

In this module, students will acquire a knowledge of methods for recombinant protein expression, protein isolation and protein purification as well as the biophysical and biochemical analysis of proteins. Current scientific publications on these topics will be presented and discussed in English.

Intended learning outcomes

Students have acquired knowledge and skills in the areas of recombinant protein expression and subsequent purification as well as protein analysis. They are able to interpret and deliver presentations on scientific publications.

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.

- 07-5S2PS3-1PP-092: Ü (no information on SWS (weekly contact hours) and course language available)
- 07-5S2PS3-2PP-092: 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 can be chosen to earn a 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 07-5S2PS3-1PP-092: Protein biochemistry and expression of recombinant proteins (laboratory course)

- 9 ECTS, Method of grading: numerical grade
- a) written examination (approx. 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 (groups of 2 or 3 candidates, approx. 60 minutes) or e) presentation (approx. 20 to 30 minutes)
- Language of assessment: German or English

Assessment in module component 07-5S2PS3-2PP-092: Protein biochemistry and expression of recombinant proteins - Progress in plant physiology (seminar)

- 1 ECTS, Method of grading: (not) successfully completed
- presentation (approx. 20 to 30 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)
Bachelor' degree (1 major) Mathematics (2007)

Module title			Abbreviation
Specific ecophysiology of plants			07-5S2PS4-092-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)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

In this module, students will learn to independently apply advanced molecular biological, chemical analytical or ecological methods. Experimental findings will be evaluated, interpreted and documented in the context of the current state of research.

Intended learning outcomes

Students are able to independently perform complex experiments in the field of plant ecophysiology, to interpret their findings in the context of the current state of research as well as to document these.

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.

- 07-5S2PS4-1OP-092: Ü (no information on SWS (weekly contact hours) and course language available)
- 07-5S2PS4-2OP-092: 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 can be chosen to earn a 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 07-5S2PS4-1OP-092: Advanced ecophysiology of plants (laboratory course)

- 9 ECTS, Method of grading: numerical grade
- a) written examination (approx. 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 (groups of 2 or 3 candidates, approx. 60 minutes) or e) presentation (approx. 20 to 30 minutes)
- Language of assessment: German or English

Assessment in module component 07-5S2PS4-2OP-092: Specific ecophysiology of plants (seminar)

- 1 ECTS, Method of grading: (not) successfully completed
- presentation (approx. 20 to 30 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)
Bachelor' degree (1 major) Mathematics (2007)

Module title			Abbreviation
Molecular biological methods in pharmaceutical biology			07-5S2PS5-092-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)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

Being involved in a current research project, students will become proficient in advanced methods in molecular plant physiology, molecular biology, biochemistry or cell culture.

Intended learning outcomes

Students are proficient in advanced methods in pharmaceutical biology with a focus on molecular biology and possess the skills necessary for conducting research in the context of research projects.

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.

- 07-5S2PS5-1MB-092: P (no information on SWS (weekly contact hours) and course language available)
- 07-5S2PS5-2MB-092: 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 can be chosen to earn a 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 07-5S2PS5-1MB-092: Molecular biological methods in pharmaceutical biology (Laboratory course)

- 9 ECTS, Method of grading: numerical grade
- a) written examination (approx. 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 (groups of 2 or 3 candidates, approx. 60 minutes) or e) presentation (approx. 20 to 30 minutes)
- Language of assessment: German or English

Assessment in module component 07-5S2PS5-2MB-092: Molecular biological methods in pharmaceutical biology (seminar)

- 1 ECTS, Method of grading: (not) successfully completed
- presentation (approx. 20 to 30 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)
Bachelor' degree (1 major) Mathematics (2007)

Module title			Abbreviation
Biochemical methods in pharmaceutical Biology			07-5S2PS6-092-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)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

Being involved in a current research project, students will become proficient in advanced methods in molecular biochemistry, protein chemistry or metabolite analysis.

Intended learning outcomes

Students are proficient in advanced methods in pharmaceutical biology with a focus on molecular biochemistry and possess the skills necessary for conducting research in the context of research projects.

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.

- 07-5S2PS6-1BC-092: P (no information on SWS (weekly contact hours) and course language available)
- 07-5S2PS6-2BC-092: 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 can be chosen to earn a 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 07-5S2PS6-1BC-092: Molecular biological methods in pharmaceutical biology (Laboratory course)

- 9 ECTS, Method of grading: numerical grade
- a) written examination (approx. 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 (groups of 2 or 3 candidates, approx. 60 minutes) or e) presentation (approx. 20 to 30 minutes)
- Language of assessment: German or English

Assessment in module component 07-5S2PS6-2BC-092: Biochemical methods in pharmaceutical Biology (seminar)

- 1 ECTS, Method of grading: (not) successfully completed
- presentation (approx. 20 to 30 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)
Bachelor' degree (1 major) Mathematics (2007)

Module title			Abbreviation
Final oral examination in Biology			07-6BK-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)**	
3	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

Using media aids, students will deliver an oral presentation of the results of their Bachelor's theses to an expert audience.

Intended learning outcomes

Students are able to present the findings of their theses in an appropriate way as well as to discuss these with an expert audience.

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

K (no information on SWS (weekly contact hours) and course language available)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

final colloquium (approx. 30 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)

Module title			Abbreviation
Bachelorthesis Biology			07-6BT-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)**	
12	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	Registration for assessment: yes	

Contents

Researching and writing on a defined problem within a given time frame and adhering to the principles of good scientific practice.

Intended learning outcomes

Students are able to conduct research on a defined topic, adhering to the principles of good scientific practice, and to present the results of their work in written 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 can be chosen to earn a bonus)

written thesis
Assessment offered: on a continuous basis after consultation with supervisor and after registration
Language of assessment: German or English

Allocation of places

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Additional information

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Workload

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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 (2007)

Module title			Abbreviation
Molecular Cell Biology for advanced students			07-6S3MZ1-092-m01
Module coordinator		**Module offered by**	
holder of the Chair of Zoology I		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
15	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

In this module, students will acquire an in-depth insight into approaches and methods in cell biology. Students will learn to apply methods in cell biology to address a scientific question.

Intended learning outcomes

The students are able to independently address scientific issues in molecular cell biology, using appropriate methods. They are able to design the appropriate experiments as well as to analyse, present and interpret the results.

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

This module comprises 2 module components. Information on courses will be listed separately for each module component.

- 07-6S3MZ1-1MZ-092: P (no information on SWS (weekly contact hours) and course language available)
- 07-6S3MZ1-2MZ-092: 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 can be chosen to earn a 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 07-6S3MZ1-1MZ-092: Advanced molecular cell biology (laboratory course)

- 12 ECTS, Method of grading: numerical grade
- a) written examination (approx. 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 (groups of 2 or 3 candidates, approx. 60 minutes) or e) presentation (approx. 20 to 30 minutes)
- Language of assessment: German, English

Assessment in module component 07-6S3MZ1-2MZ-092: Current topics in molecular cell biology - (seminar)

- 3 ECTS, Method of grading: (not) successfully completed
- presentation (approx. 20 to 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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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Bachelor' degree (1 major) Biology (2007)

Module title			Abbreviation
Molecular Developmental Biology for advanced students			07-6S3MZ-2-092-m01
Module coordinator		**Module offered by**	
holder of the Chair of Zoology I		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
15	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

The students perform their research work within a current research project on the topic of molecular developmental biology in a largely independent manner under supervision of a principal investigator.

Intended learning outcomes

The students are able to independently address scientific issues in molecular developmental biology, using appropriate methods. They are able to design the appropriate experiments as well as to analyse, present and interpret the results.

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

This module comprises 2 module components. Information on courses will be listed separately for each module component.

- 07-6S3MZ2-1ME-092: P (no information on SWS (weekly contact hours) and course language available)
- 07-6S3MZ2-2ME-092: 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 can be chosen to earn a 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 07-6S3MZ2-1ME-092: Advanced molecular developmental biology (laboratory course)

- 12 ECTS, Method of grading: numerical grade
- a) written examination (approx. 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 (groups of 2 or 3 candidates, approx. 60 minutes) or e) presentation (approx. 20 to 30 minutes)
- Language of assessment: German, English

Assessment in module component 07-6S3MZ2-2ME-092: Current topics in molecular developmental biology (seminar)

- 3 ECTS, Method of grading: (not) successfully completed
- presentation (approx. 20 to 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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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Bachelor' degree (1 major) Biology (2007)

Module title			Abbreviation
Specific Microbiology III			07-6S3MZ-3-092-m01
Module coordinator		**Module offered by**	
holder of the Chair of Microbiology		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
15	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

The students perform their research work within a current research project on the topic of microbiology in a largely independent manner under supervision of a principal investigator.

Intended learning outcomes

The students are able to independently address scientific issues in microbiology, using appropriate methods. They are able to design the appropriate experiments as well as to analyse, present and interpret the results.

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

This module comprises 2 module components. Information on courses will be listed separately for each module component.

- 07-6S3MZ3-1MI-092: P (no information on SWS (weekly contact hours) and course language available)
- 07-6S3MZ3-2MI-092: 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 can be chosen to earn a 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 07-6S3MZ3-1MI-092: Specific microbiology 3 (laboratory course)

- 10 ECTS, Method of grading: numerical grade
- a) written examination (approx. 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 (groups of 2 or 3 candidates, approx. 60 minutes) or e) presentation (approx. 20 to 30 minutes)
- Language of assessment: German, English

Assessment in module component 07-6S3MZ3-2MI-092: Specific microbiology 3 (seminar)

- 5 ECTS, Method of grading: (not) successfully completed
- presentation (approx. 20 to 30 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)

Module title			Abbreviation
Specific Biotechnology III			07-6S3MZ4-092-m01
Module coordinator		**Module offered by**	
holder of the Chair of Biotechnology and Biophysics		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
15	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

The students perform their research work within a current research project on the topic of biotechnology in a largely independent manner under supervision of a principal investigator.

Intended learning outcomes

The students are able to independently address scientific issues in biotechnology, using appropriate methods. They are able to design the appropriate experiments as well as to analyse, present and interpret the results.

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

This module comprises 2 module components. Information on courses will be listed separately for each module component.

- 07-6S3MZ4-1BT-092: P (no information on SWS (weekly contact hours) and course language available)
- 07-6S3MZ4-2BT-092: 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 can be chosen to earn a 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 07-6S3MZ4-1BT-092: Specific biotechnology 3 (laboratory course)

- 12 ECTS, Method of grading: numerical grade
- a) written examination (approx. 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 (groups of 2 or 3 candidates, approx. 60 minutes) or e) presentation (approx. 20 to 30 minutes)
- Assessment offered: once a year, summer semester
- Language of assessment: German, English

Assessment in module component 07-6S3MZ4-2BT-092: Specific biotechnology 3 (seminar)

- 3 ECTS, Method of grading: (not) successfully completed
- presentation (approx. 20 to 30 minutes)
- Assessment offered: once a year, summer semester

Allocation of places

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Additional information

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Workload

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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 (2007)

Module title			Abbreviation
Specific Bioinformatics III			07-6S3MZ5-092-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)**	
15	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

In this module, students will acquire an in-depth insight into approaches and methods in bioinformatics. Students will learn to address a scientific problem in bioinformatics.

Intended learning outcomes

The students are able to independently address scientific issues in bioinformatics, using appropriate methods. They are able to design the appropriate experiments as well as to analyse, present and interpret the results.

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

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

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

a) written examination (approx. 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 (groups of up to 3 candidates, approx. 60 minutes) or e) presentation (approx. 20 to 30 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)

Module title			Abbreviation
Neurobiology III			07-6S3NVO1-092-m01
Module coordinator		**Module offered by**	
holder of the Chair of Neurobiology and Genetics		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
15	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

In this module, students will acquire specific insights into topics, approaches and methods in neurobiology. Students will also be involved in current research projects.

Intended learning outcomes

Students will be proficient in the theory and practice of research in the field of neurobiology and will have developed skills required for a career in research.

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.

- 07-6S3NVO1-1NB-092: P (no information on SWS (weekly contact hours) and course language available)
- 07-6S3NVO1-2NB-092: 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 can be chosen to earn a 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 07-6S3NVO1-1NB-092: Neurobiology 3 (laboratory course)

- 10 ECTS, Method of grading: numerical grade
- a) written examination (approx. 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 (groups of 2 or 3 candidates, approx. 60 minutes) or e) presentation (approx. 20 to 30 minutes)
- Language of assessment: German, English

Assessment in module component 07-6S3NVO1-2NB-092: Neurobiology 3 (seminar)

- 5 ECTS, Method of grading: (not) successfully completed
- presentation (approx. 20 to 30 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)

Module title			Abbreviation
Integrative Behavioural Biology III			07-6S3NVO2-092-m01
Module coordinator		**Module offered by**	
holder of the Chair of Zoology II		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
15	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	By way of exception, additional prerequisites are listed in the section on assessments.	

Contents

In this module, students will acquire specific insights into topics, approaches and methods in integrative behavioural biology. Students will also be involved in current research projects in the area of experimental behavioural physiology and sociobiology.

Intended learning outcomes

Students will be proficient in the theory and practice of research in the field of integrative behavioural biology and will have developed skills required for a career in research.

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.

- 07-6S3NVO2-1IV-092: P (no information on SWS (weekly contact hours) and course language available)
- 07-6S3NVO2-2IV-092: 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 can be chosen to earn a 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 07-6S3NVO2-1IV-092: Integrative behavioural biology 3 (laboratory course)

- 12 ECTS, Method of grading: numerical grade
- a) written examination (approx. 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 (groups of 2 or 3 candidates, approx. 60 minutes) or e) presentation (approx. 20 to 30 minutes)
- Language of assessment: German, English
- Other prerequisites: A good command of the English language is recommended.

Assessment in module component 07-6S3NVO2-2IV-092: Integrative behavioural biology 3 - Current topics in behavioural biology and socio-biology (seminar))

- 3 ECTS, Method of grading: (not) successfully completed
- presentation (approx. 20 to 30 minutes)
- Language of assessment: German, English
- Other prerequisites: A good command of the English language is recommended.

Allocation of places

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Additional information

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Workload

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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 (2007)

Module title			Abbreviation
Ecology of animals III			07-6S3NV03-092-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)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

In this module, students will acquire insights into topics, approaches and methods in special animal ecology. Students will also be involved in current research projects.

Intended learning outcomes

Students are proficient in the theory and practice of research in the field of special animal ecology. They are able to analyse their own research findings, to present these as well as to discuss these in the context of current publications.

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.

- 07-6S3NV03-1TO-092: Ü (no information on SWS (weekly contact hours) and course language available)
- 07-6S3NV03-2TO-092: 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 can be chosen to earn a 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 07-6S3NV03-1TO-092: Ecology of animals 3 (practical course)

- 8 ECTS, Method of grading: numerical grade
- a) written examination (approx. 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 (groups of 2 or 3 candidates, approx. 60 minutes) or e) presentation (approx. 20 to 30 minutes)
- Language of assessment: German or English

Assessment in module component 07-6S3NV03-2TO-092: Ecology of animals 3 (seminar)

- 2 ECTS, Method of grading: (not) successfully completed
- presentation (approx. 20 to 30 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)

Module title			Abbreviation
Ecological modelling			07-6S3NV04-092-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	--	

Contents

On the basis of exemplary tasks in ecology, the students will learn about different simulation techniques and modelling methods. At the same time, they will develop their own simulation program to address demographical or evolutionary questions.

Intended learning outcomes

The students will expand their knowledge in the theory and practice of ecological modelling. They will be able to develop, apply and interpret adequate modelling 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.

- 07-6S3NV04-1MO-092: V + Ü (no information on SWS (weekly contact hours) and course language available)
- 07-6S3NV04-2MO-092: 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 can be chosen to earn a 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 07-6S3NV04-1MO-092: Ecological modelling - Strategies of modelling in ecological science (lecture and practical course) Ecological modelling - Strategies of modelling in ecological science (lecture and practical course)

- 4 ECTS, Method of grading: numerical grade
- a) written examination (approx. 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 (groups of 2 or 3 candidates, approx. 60 minutes) or e) presentation (approx. 20 to 30 minutes)
- Language of assessment: German, English

Assessment in module component 07-6S3NV04-2MO-092: Ecological modelling (seminar)

- 1 ECTS, Method of grading: (not) successfully completed
- presentation (approx. 20 to 30 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)

Module title			Abbreviation
Tropical Biology			07-6S3NV05-092-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	--	

Contents

This module provides the fundamentals of the biology of tropical habitats and tropical communities.

Intended learning outcomes

Students will be able to recognise the special position of tropical habitats within the biosphere and to explain the significance tropical habitats have for the ecosystem. They will be able to discuss and deliver presentations on current publications in the field of tropical biology.

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.

- 07-6S3NV05-1TB-092: V (no information on SWS (weekly contact hours) and course language available)
- 07-6S3NV05-2TB-092: 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 can be chosen to earn a 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 07-6S3NV05-1TB-092: Tropical biology (lecture)

- 3 ECTS, Method of grading: numerical grade
- a) written examination (approx. 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 (groups of 2 or 3 candidates, approx. 60 minutes) or e) presentation (approx. 20 to 30 minutes)
- Language of assessment: German, English

Assessment in module component 07-6S3NV05-2TB-092: Tropical biology (seminar)

- 2 ECTS, Method of grading: (not) successfully completed
- presentation (approx. 20 to 30 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)

Module title			Abbreviation
Biology of nature conservation			07-6S3NVO6-092-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	--	

Contents

The module will discuss biodiversity, focusing on the issue of biodiversity loss and related issues in the area of nature conservation. By way of examples, students will be introduced to the theory and practice of conservation biology.

Intended learning outcomes

Students have developed skills in the area of national and international nature conservation. They are able to critically evaluate whether particular steps in the project management cycle can help reach the defined conservation targets.

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.

- 07-6S3NVO6-1NB-092: V (no information on SWS (weekly contact hours) and course language available)
- 07-6S3NVO6-2NB-092: S (no information on SWS (weekly contact hours) and course language available)
- 07-6S3NVO6-3NB-092: 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 can be chosen to earn a 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 07-6S3NVO6-1NB-092: Biology of nature conservation - Aspects of nature conservation and biodiversity (lecture)

- 1 ECTS, Method of grading: numerical grade
- written examination (20 minutes)

Assessment in module component 07-6S3NVO6-2NB-092: Biology of nature conservation - Seminar on nature conservation and biodiversity

- 2 ECTS, Method of grading: (not) successfully completed
- presentation (approx. 20 to 30 minutes)

Assessment in module component 07-6S3NVO6-3NB-092: Biology of nature conservation - Field excursion

- 2 ECTS, Method of grading: (not) successfully completed
- log (approx. 1 to 2 pages) and presentation (approx. 10 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)

Module title			Abbreviation
Specific Aspects in Plant Molecular Biology			07-6S3PS1-092-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)**	
15	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

Using the examples of topics in contemporary research, students will be introduced to the concepts of good scientific practice, including planning research strategies, performing complex experiments as well as documenting and communicating research findings in the form of a presentation, a publication or a term paper. Students will be involved in ongoing research and will learn how to independently apply advanced methods in modern plant sciences. In addition they will acquire an advanced knowledge of the molecular basics of membrane transport.

Intended learning outcomes

Students are able to independently use advanced methods in plant molecular biology. They are able to independently address and document questions in the field of plant biology, adhering to the principles of good scientific practice.

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.

- 07-6S3PS1-1MB-092: Ü (no information on SWS (weekly contact hours) and course language available)
- 07-6S3PS1-2MB-092: 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 can be chosen to earn a 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 07-6S3PS1-1MB-092: Specific aspects of plant molecular biology (laboratory course)

- 12 ECTS, Method of grading: numerical grade
- a) written examination (approx. 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 (groups of 2 or 3 candidates, approx. 60 minutes) or e) presentation (approx. 20 to 30 minutes)
- Assessment offered: once a year, summer semester
- Language of assessment: German or English

Assessment in module component 07-6S3PS1-2MB-092: Specific aspects of plant molecular biology (seminar)

- 3 ECTS, Method of grading: (not) successfully completed
- presentation (approx. 20 to 30 minutes)
- Assessment offered: once a year, summer semester

Allocation of places

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Additional information

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Workload

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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 (2007)

Module title			Abbreviation
Protein Chemistry in Biosensorics			07-6S3PS2-092-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)**	
15	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

Using the examples of topics in contemporary research, students will be introduced to the concepts of good scientific practice, including planning research strategies, performing complex experiments as well as documenting and communicating research findings in the form of a presentation, a publication or a term paper. Students will be involved in ongoing research and will learn to independently apply advanced methods in biophysics and protein chemistry. In addition, they will acquire an advanced knowledge of the mechanisms and structure-function relationships of chemo- and photoreceptors in particular.

Intended learning outcomes

Students are able to independently use advanced methods in the protein chemistry of biosensors. They are able to independently address and document questions in the field of plant biology, adhering to the principles of good scientific practice.

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.

- 07-6S3PS2-1BS-092: Ü (no information on SWS (weekly contact hours) and course language available)
- 07-6S3PS2-2BS-092: 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 can be chosen to earn a 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 07-6S3PS2-1BS-092: Protein biochemistry and biosensoric (laboratory course)

- 12 ECTS, Method of grading: numerical grade
- a) written examination (approx. 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 (groups of 2 or 3 candidates, approx. 60 minutes) or e) presentation (approx. 20 to 30 minutes)
- Assessment offered: once a year, summer semester
- Language of assessment: German, English

Assessment in module component 07-6S3PS2-2BS-092: Protein biochemistry and biosensoric (seminar)

- 3 ECTS, Method of grading: (not) successfully completed
- presentation (approx. 20 to 30 minutes)
- Assessment offered: once a year, summer semester

Allocation of places

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Additional information

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Workload

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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 (2007)

Module title			Abbreviation
Experimental biology of membrane transport mechanisms			07-6S3PS3-092-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)**	
15	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

Using the examples of topics in contemporary research, students will be introduced to the concepts of good scientific practice, including planning research strategies, performing complex experiments as well as documenting and communicating research findings in the form of a presentation, a publication or a term paper. Students will be involved in ongoing research and will learn how to independently apply advanced methods in molecular biology and biophysics. In addition they will acquire an advanced knowledge of membrane transport in particular.

Intended learning outcomes

Students are able to independently use advanced methods in the experimental biology of membrane transport. They are able to independently address and document questions in the field of plant biology, adhering to the principles of good scientific practice.

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.

- 07-6S3PS3-1MT-092: Ü (no information on SWS (weekly contact hours) and course language available)
- 07-6S3PS3-2MT-092: 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 can be chosen to earn a 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 07-6S3PS3-1MT-092: Experimental biology of membrane transport mechanisms (laboratory course)

- 12 ECTS, Method of grading: numerical grade
- a) written examination (approx. 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 (groups of 2 or 3 candidates, approx. 60 minutes) or e) presentation (approx. 20 to 30 minutes)
- Assessment offered: once a year, summer semester
- Language of assessment: German, English

Assessment in module component 07-6S3PS3-2MT-092: Experimental biology of membrane transport mechanisms (seminar)

- 3 ECTS, Method of grading: (not) successfully completed
- presentation (approx. 20 to 30 minutes)
- Assessment offered: once a year, summer semester

Allocation of places

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Additional information

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Workload

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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 (2007)

Module title			Abbreviation
Scientific experimental work in plant ecophysiology			07-6S3PS4-092-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)**	
15	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

Using the examples of topics in contemporary research, students will be introduced to the concepts of good scientific practice, including planning research strategies, performing complex experiments as well as documenting and communicating research findings in the form of a presentation, a publication or a term paper. Students will be involved in ongoing research and will learn how to independently apply advanced methods in ecophysiology, analytical chemistry or molecular biology.

Intended learning outcomes

Students are able to independently conduct research on the ecophysiology of plants. They are able to independently address and document questions in the field of plant biology, adhering to the principles of good scientific practice.

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.

- 07-6S3PS4-1SA-092: Ü + R (no information on SWS (weekly contact hours) and course language available)
- 07-6S3PS4-2SA-092: 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 can be chosen to earn a 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 07-6S3PS4-1SA-092: Scientific experimental work in plant ecophysiology - (practical and project work) Scientific experimental work in plant ecophysiology - (practical and project work)

- 14 ECTS, Method of grading: numerical grade
- a) written examination (approx. 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 (groups of 2 or 3 candidates, approx. 60 minutes) or e) presentation (approx. 20 to 30 minutes)
- Assessment offered: once a year, summer semester
- Language of assessment: German, English

Assessment in module component 07-6S3PS4-2SA-092: Scientific experimental work in plant ecophysiology - (seminar)

- 1 ECTS, Method of grading: (not) successfully completed
- presentation (approx. 20 to 30 minutes)
- Assessment offered: once a year, summer semester

Allocation of places

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Additional information

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Workload

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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 (2007)

Module title			Abbreviation
Research Project in Pharmaceutical Biology with Focus on Molecular Biology			07-6S3PS5-092-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)**	
15	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

Using the examples of topics in contemporary research, students will be introduced to the concepts of good scientific practice, including planning research strategies, performing complex experiments as well as documenting and communicating research findings in the form of a presentation, a publication or a term paper. Students will be involved in ongoing research and will learn how to independently apply specific methods in pharmaceutical biology with a focus on molecular biology.

Intended learning outcomes

Students are able to independently pursue research projects in the field of pharmaceutical biology with a focus on molecular biology. They are able to independently address and document questions in the field of plant biology, adhering to the principles of good scientific practice.

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.

- 07-6S3PS5-1FM-092: P (no information on SWS (weekly contact hours) and course language available)
- 07-6S3PS5-2FM-092: 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 can be chosen to earn a 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 07-6S3PS5-1FM-092: Scientific project in pharmaceutical biology with main focus on molecular biology (laboratory course)

- 13 ECTS, Method of grading: numerical grade
- a) written examination (approx. 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 (groups of 2 or 3 candidates, approx. 60 minutes) or e) presentation (approx. 20 to 30 minutes)
- Language of assessment: German, English

Assessment in module component 07-6S3PS5-2FM-092: Research project in pharmaceutical biology with main focus on molecular biology (seminar)

- 2 ECTS, Method of grading: (not) successfully completed
- presentation (approx. 20 to 30 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)

Module title			Abbreviation
Research Project in Pharmaceutical Biology with Focus on Molecular Biochemistry			07-6S3PS6-092-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)**	
15	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

Using the examples of topics in contemporary research, students will be introduced to the concepts of good scientific practice, including planning research strategies, performing complex experiments as well as documenting and communicating research findings in the form of a presentation, a publication or a term paper. Students will be involved in ongoing research and will learn how to independently apply specific methods in pharmaceutical biology with a focus on molecular biochemistry.

Intended learning outcomes

Students are able to independently pursue research projects in the field of pharmaceutical biology with a focus on molecular biochemistry. They are able to independently address and document questions in the field of plant biology, adhering to the principles of good scientific practice.

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.

- 07-6S3PS6-1FB-092: P (no information on SWS (weekly contact hours) and course language available)
- 07-6S3PS6-2FB-092: 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 can be chosen to earn a 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 07-6S3PS6-1FB-092: Research project in pharmaceutical biology with focus on biochemistry (laboratory course)

- 13 ECTS, Method of grading: numerical grade
- a) written examination (approx. 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 (groups of 2 or 3 candidates, approx. 60 minutes) or e) presentation (approx. 20 to 30 minutes)
- Language of assessment: German, English

Assessment in module component 07-6S3PS6-2FB-092: Scientific project in pharmaceutical biology with main focus on biochemistry (seminar)

- 2 ECTS, Method of grading: (not) successfully completed
- presentation (approx. 20 to 30 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)

Module title			Abbreviation
Biotechnology and Social Acceptance			07-SQF-BGA-092-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)**	
3	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

Applications of green biotechnology; biological background, economic interests, ecological risks, social acceptability.

Intended learning outcomes

Students are able to discuss/evaluate society's views of biotechnology. They know how to conduct a literature search and are able to critically review scientific publications as well as issues raised by society. Students have enhanced their oral and written presentation skills and are able to use these to present the data they have collected.

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 can be chosen to earn a bonus)

term paper or preparing educational materials (5 to 10 pages) and presentation (approx. 20 to 30 minutes), weighted 1:1

Allocation of places

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Additional information

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Workload

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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 (2007)

Module title			Abbreviation
Data Processing in Plant Sciences			07-SQF-DBP-092-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)**	
2	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

This course will equip students with fundamental skills in the processing of data that was collected in the context of research in plant sciences. Using specific software (e. g. Excel, Statistica, SigmaPlot), students will practise fundamental methods of descriptive and inferential statistics. Suitable methods of data analysis will be presented and selected. The course will explain what sample size is appropriate for statistical analysis and what methods are appropriate for specific problems. The data will then be represented graphically and discussed.

Intended learning outcomes

Students have developed essential skills in statistical methods that enable them to plan and analyse scientific experiments. They are able to select suitable software for processing the data obtained and to use this to develop conclusive scientific arguments. Students are also able to graphically represent their findings.

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 can be chosen to earn a bonus)

practice work (approx. 45 minutes) and presentation (approx. 15 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)

Module title			Abbreviation
Global Acting in globally and locally linked decision processes			07-SQF-GHE-092-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)**	
3	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

Decision making processes in the context of global and local requirements. The course will discuss findings from different fields of biology and/or biotechnology with regard to their socio-political relevance. Topics will vary and will reflect the latest trends and developments. Topics that might be covered include: - Global threats -- making the right decision. - Decision making and disposal. - Decision making processes of social insects. - Ecosystems as an example of "ecology vs. economy".

Intended learning outcomes

Students will be able to meet global requirements in spite of local constraints and requirements and will understand the limitations in decision making processes. They will have developed a deeper awareness of complex issues and will be better qualified to adapt the opportunities and/or necessities associated with global challenges to specific local conditions as well as to implement these. With the help of topical examples from nature (e. g. ecology, sociobiology), the course will have acquainted students with principles that may help understand problems relevant to society and develop approaches to solution.

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 can be chosen to earn a bonus)

log (approx. 10 to 20 pages)

Allocation of places

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Additional information

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Workload

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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 (2007)

Module title			Abbreviation
Outstanding Publications in Biology			07-SQF-HVB-092-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)**	
2	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

Students will discuss selected scientific publications in the field of biology, publications that are either of historical significance and therefore considered ground-breaking or that discuss methods and techniques that helped advance research in the area of biology.

Intended learning outcomes

Students are able to trace the development of a modern discipline in the natural sciences, using the example of biology. They understand the importance of ground-breaking ideas and methods that opened up new horizons. Students are able to understand as well as to critically present and discuss key elements of major scientific findings/publications. A retrospective review of these "key publications" has given students a feeling for how to evaluate new developments in science.

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 can be chosen to earn a bonus)

presentation (approx. 45 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)

Module title			Abbreviation
Patents in Biology			07-SQF-PRB-092-m01
Module coordinator		**Module offered by**	
holder of the Chair of Biotechnology and Biophysics		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
2	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

Patents in biology: types, application, specification, patent rights, patent search.

Intended learning outcomes

Students have acquired a fundamental knowledge of the criteria that determine whether ideas, inventions and developments in the life sciences in general and in biotechnology in particular are patentable. They are familiar with patent authorities and relevant data sources. Students are able to judge whether ideas, developments and inventions are patentable and, where necessary, to consult with competent advisors at the University that will help them conduct a cost-benefit analysis prior to publishing their ideas.

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 can be chosen to earn a bonus)

written examination (approx. 20 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)

Module title			Abbreviation
Operational Safety in ecophysiological Laboratories			07-SQF-SAL-092-m01
Module coordinator		**Module offered by**	
degree programme coordinator Biologie (Biology)		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
1	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

There are risks and hazards associated with working in ecophysiology and analytical chemistry laboratories. In this module, students will become familiar with the fundamentals for recognising, assessing, avoiding and eliminating potential safety hazards and will practise safe laboratory working procedures in accordance with statutory provisions.

Intended learning outcomes

Students know how to handle hazardous substances typically used in ecophysiology and analytical chemistry laboratories and are able to recognise and eliminate safety hazards. They are familiar with the most important statutory provisions on health and safety and accident prevention. Students are able to adhere to the respective safety practices when working in the lab and have developed an increased alertness toward potential safety hazards in the lab.

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 can be chosen to earn a bonus)

written examination (approx. 15 minutes)

Allocation of places

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Additional information

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Workload

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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 (2007)

Module title			Abbreviation
Supervising Tutorial for Basic Courses			07-SQF-TFB-072-m01
Module coordinator		**Module offered by**	
degree programme coordinator Biologie (Biology)		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
4	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

Working as tutors, students will mentor other students during the modules *Allgemeine Biologie* (*General Biology*) I through III in particular. Tutors will help students improve upon their understanding of material, consolidate their knowledge and prepare for assessments. They will correct exercises, will discuss these with students and will help them fill gaps in their knowledge. Tutors will support other students on their way towards academic success.

Intended learning outcomes

The tutors are able to communicate complex concepts in a clear and structured way. They have gained experience supervising a group. Having prepared for answering specific questions and explaining material in detail, the tutors have also enhanced their own subject-specific skills. They have enhanced their teaching skills.

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

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 can be chosen to earn a bonus)

preparing materials for exercises including solutions and suggestions for solutions (minimum 30 (complex) questions including answers and/or suggestions for solutions; questions must be formulated in such a way that they can be answered in approx. 0.5 pages each)

Allocation of places

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Additional information

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Workload

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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 (2007)

Module title			Abbreviation
Supervising Tutorial for Biology			07-SQF-TSB-072-m01
Module coordinator		**Module offered by**	
degree programme coordinator Biologie (Biology)		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
3	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

Working as tutors, students will mentor other students during the modules *Allgemeine Biologie* (*General Biology*) I through III in particular. Tutors will help with organisational and personal matters and will help students improve upon their understanding of material, consolidate their knowledge and prepare for assessments. Together with students, they will develop strategies to detect and fill gaps in their knowledge. Tutors will support other students on their way towards academic success.

Intended learning outcomes

The tutors are able to communicate complex concepts in a clear and structured way. They have gained experience supervising a group and helping students with personal matters. The tutors have thus enhanced their own interpersonal skills and know how to share their expertise in exploring complex topics. In addition, the tutors have learned to plan and organise key elements of their own university education and the university education of the students they mentor.

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

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 can be chosen to earn a bonus)

preparation of materials for demonstrations and/or exercises to provide information on the degree programme, its focuses and possibilities (preparing a presentation with at least 20 individual slides and/or diagrams providing information on important criteria in relation to the degree programme and the course of studies)

Allocation of places

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Additional information

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Workload

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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 (2007)

Module title			Abbreviation
Environmental Education in the Botanical Garden of the University			07-SQF-UBG-092-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)**	
2	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

The Botanical Garden of the University of Würzburg is primarily used for teaching and research-related activities. In addition, it is used for activities in the area of general environmental education with the plants in the different sections and collections being used to inform interested members of the public about topics in the areas of botany, ecology and gardening. In this module, students will develop appropriate educational concepts for imparting, in a comprehensible way, specialist knowledge to interested laypersons. They will practise designing and using appropriate aids (information boards, leaflets etc.) and applying methodological approaches (guidelines) for the comprehensible presentation of complex concepts. Students will be organised into teams to complete the following tasks: develop contents tailored to the needs of selected target groups, acquire the specialist knowledge necessary for presenting these contents, select appropriate methods for presenting these contents.

Intended learning outcomes

Students will be able to communicate concepts in ecology and botany to a lay audience. They will be able to tailor contents to a target audience, selecting and using appropriate aids and techniques. Students will have acquired an overview of the sectors of the Botanical Garden and will be able to prepare information material on individual sections. They will have developed both botanical knowledge and teaching skills that will enable them to guide tours through the Botanical Garden, imparting knowledge in a way that is tailored to their target audience.

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

Ü + 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 can be chosen to earn a bonus)

term paper or preparing educational materials (5 to 10 pages) and presentation (approx. 20 to 30 minutes), weighted 1:1

Allocation of places

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Additional information

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Workload

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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 (2007)

Module title			Abbreviation
Publishing Scientific Data			07-SQF-WIP-092-m01
Module coordinator		**Module offered by**	
Coordinator BioCareers		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

Either alone or in small groups of two or three persons, students will select several journal articles from the field of life sciences. These will serve as the basis for a review article to be prepared by students. With two or three "core publications" as a basis, students will search data bases (e. g. PubMed) for literature that is directly related to these articles. The most important current original publications will be summed up in a review article; where applicable, students may also use their own raw data. The structure of this review article will comply with the standards of the scientific community as defined in the instructions to authors of a scientific journal. The article will contain at least one figure, one table as well as one schematic representation of the contents and will be divided up into the following sections: title, abstract, introduction and/or hypothesis/problem to be investigated, summary of results as well as current developments and discussion thereof. The article will also contain citations in the specified format. Students will also deliver a presentation on the contents of the article.

Intended learning outcomes

Students will have learned to conduct a literature search on a specific topic. They will know how to get an overview of recent publications on a specific topic and will be familiar with basic rules for summing up original publications in a review article complying with the standards of the scientific community. Students will be familiar with the standards regarding the structure of reviews and will be able to properly cite sources. They will thus know what to keep in mind when writing scientific articles. In addition, students will be able to prepare and deliver an oral presentation on raw scientific data.

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 can be chosen to earn a bonus)

term paper (approx. 5 to 10 pages) and presentation (approx. 15 minutes), weighted 2:1

Allocation of places

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Additional information

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Workload

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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 (2007)

Module title	Abbreviation
Inorganic Chemistry for Biology Majors	08-AC-Bio-072-m01

Module coordinator	Module offered by
lecturer of lecture "Allgemeine and Anorganische Chemie für Studierende der Medizin, Zahnmedizin and Biologie" (General and Inorganic Chemistry for Students of Medicine, Dentistry and Biology)	Institute of Inorganic Chemistry

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 provides students with an overview of the theoretical principles of inorganic chemistry. In addition, it introduces the fundamental techniques of inorganic chemistry in a lab course.

Intended learning outcomes

Students have become familiar with the fundamental principles of inorganic chemistry. They are able to identify fundamental problems in chemistry and perform experiments to solve them.

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.

- 08-AC-NF-1-072: V (no information on SWS (weekly contact hours) and course language available)
- 08-AC-Bio-2-072: 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 can be chosen to earn a 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 08-AC-NF-1-072: Inorganic Chemistry (lecture)

- 3 ECTS, Method of grading: numerical grade
- written examination (60 minutes)

Assessment in module component 08-AC-Bio-2-072: Chemistry Lab for Biology Majors

- 2 ECTS, Method of grading: (not) successfully completed
- Vortestate (pre-experiment exams, approx. 15 minutes each), assessment of practical performance (log approx. 5 to 10 pages), Nachtestate (post-experiment exams, approx. 15 minutes each)
- Only after successful completion of module components: Successful completion of module component 08-AC-NF-1 is a prerequisite for participation in module component 08-AC-Bio-2.

Allocation of places

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Additional information

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Workload

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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 (2007)

Module title			Abbreviation
Biochemistry for students of biological sciences			08-BCB-072-m01
Module coordinator		**Module offered by**	
holder of the Chair of Biochemistry		Chair of Biochemistry	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
6	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
2 semester	undergraduate	--	

Contents

Comprising lectures and exercises, this module acquaints students with the fundamental principles of biochemistry.

Intended learning outcomes

Students have become familiar with the fundamental principles of biochemistry. They are able to describe the key biochemical processes in cellular systems.

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 can be chosen to earn a bonus)

written examination (approx. 90 minutes)

Allocation of places

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Additional information

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Workload

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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)

Module title			Abbreviation
Biochemistry for students of biological sciences (practical course)			08-BCPB-072-m01
Module coordinator		**Module offered by**	
holder of the Chair of Biochemistry		Chair of Biochemistry	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

Practical exercises give students the opportunity to learn the fundamental principles of conducting biochemical experiments.

Intended learning outcomes

Students have become proficient in essential methods in biochemistry.

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 can be chosen to earn a bonus)

Vortestate (pre-experiment exams, approx. 15 minutes each), assessment of practical performance (log approx. 5 to 10 pages), Nachtestate (post-experiment exams, approx. 15 minutes each)
Assessment offered: once a year, summer semester

Allocation of places

Number of places: 25 per group.

Additional information

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Workload

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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 (2013)
Bachelor' degree (1 major) Biology (2010)

Module title			Abbreviation
Organic Chemistry for students of biology			08-OC-Bio-072-m01
Module coordinator		**Module offered by**	
lecturer of lecture "Organische Chemie für Studierende der Medizin, Biomedizin, Zahnmedizin, Ingenieur- and Naturwissenschaften"		Institute of Organic Chemistry	
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 provides students with an overview of the theoretical principles of organic chemistry. In addition, it introduces the fundamental techniques of organic chemistry in a lab course.

Intended learning outcomes

Students have become familiar with the fundamental principles of organic chemistry. They are able to identify fundamental problems in chemistry and perform experiments to solve them.

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.

- 08-IOC-1-072: V (no information on SWS (weekly contact hours) and course language available)
- 08-OC-Bio-2-072: P (no information on SWS (weekly contact hours) and course language available)
- 08-OC-Bio-3-072: 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 can be chosen to earn a 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 08-IOC-1-072: Organic Chemistry for students of medicine, biomedicine, dental medicine, engineering and natural science

- 3 ECTS, Method of grading: numerical grade
- written examination (approx. 60 minutes)

Assessment in module component 08-OC-Bio-2-072: Organic Chemistry 2 for students of biology

- 4 ECTS, Method of grading: numerical grade
- written examination (60 minutes)

Assessment in module component 08-OC-Bio-3-072: Organic Chemistry - laboratory course for students of biology

- 3 ECTS, Method of grading: (not) successfully completed
- Vortestate (pre-experiment exams, approx. 15 minutes each), assessment of practical performance (log approx. 5 to 10 pages), Nachtestate (post-experiment exams, approx. 15 minutes each)
- Assessment offered: once a year, winter semester
- Only after successful completion of module components: Successful completion of module component 08-IOC-1 is a prerequisite for participation in module component 08-OC-Bio-3.

Allocation of places

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Additional information

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Workload

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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 (2007)

Module title			Abbreviation
Physical Chemistry for Biology Majors			08-PC-Bio-072-m01
Module coordinator		**Module offered by**	
lecturer of lecture "Thermodynamik, Kinetik, Elektrochemie für Studierende der Biologie and Lebensmittelchemie"		Institute of Physical and Theoretical Chemistry	
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 discusses the fundamental principles of thermodynamics, kinetics and electrochemistry.

Intended learning outcomes

Students have become familiar with the fundamental principles of thermodynamics, kinetics and electrochemistry. They are able to understand and explain fundamental processes in nature and engineering.

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.

- 08-PC-Bio-1-062: V + Ü (no information on SWS (weekly contact hours) and course language available)
- 08-PC-Bio-2-072: 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 can be chosen to earn a 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 08-PC-Bio-1-062: Thermodynamics, Kinetics, Electrochemistry (lecture) Thermodynamics, Kinetics, Electrochemistry (lecture)

- 4 ECTS, Method of grading: numerical grade
- written examination (60 minutes)

Assessment in module component 08-PC-Bio-2-072: Physical Chemistry (lecture and lab)

- 1 ECTS, Method of grading: (not) successfully completed
- Vortestate (pre-experiment exams, approx. 15 minutes each), assessment of practical performance (log approx. 5 to 10 pages), Nachtestate (post-experiment exams, approx. 15 minutes each)
- Assessment offered: once a year, winter semester

Allocation of places

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Additional information

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Workload

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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 (2007)
Bachelor' degree (1 major) Food Chemistry (2009)

Module title			Abbreviation
Mathematics for students in Chemistry and Biology			10-M-MCB-072-m01
Module coordinator		**Module offered by**	
Dean of Studies Mathematik (Mathematics)		Institute of Mathematics	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

Functional relations, differentiation and integration of functions in one variable, curve sketching, differentiation of functions in several variables, power series, ordinary differential equations, systems of linear equations, basic notions in statistics.

Intended learning outcomes

The student is able to recognise and phrase simple questions from natural sciences as mathematical problems, apply basic mathematical methods to them and interpret the results.

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

This module comprises 2 module components. Information on courses will be listed separately for each module component.

- 10-M-MCB-1-072: V (no information on SWS (weekly contact hours) and course language available)
- 10-M-MCB-2-072: 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 can be chosen to earn a 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-MCB-1-072: Mathematics for students in Chemistry and Biology

- 3 ECTS, Method of grading: numerical grade
- written examination (120 minutes)

Assessment in module component 10-M-MCB-2-072: Exercises in Mathematics for students in Chemistry and Biology

- 2 ECTS, Method of grading: (not) successfully completed
- exercises (to be submitted on a weekly basis, written examination)

Allocation of places

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Additional information

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Workload

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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 (2007)
Bachelor' degree (1 major) Chemistry (2007)
Bachelor' degree (1 major) Chemistry (2008)

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 can be chosen to earn a 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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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' degree (1 major) Mathematics (2014)
Bachelor' degree (1 major) Mathematics (2012)
Bachelor' degree (1 major) Mathematics (2013)

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

Module title			Abbreviation
Practical Course Physics for Students of Non-physics-related Minor Subjects			11-PFNF-072-m01
Module coordinator		**Module offered by**	
Managing Director of the Institute of Applied Physics		Faculty of Physics and Astronomy	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
3	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

Mechanics, vibration theory, thermodynamics, optics, X-rays, nuclear magnetic resonance, Atomic and Nuclear Physics.

Intended learning outcomes

The students have knowledge of the principles of Physics.

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

P (no information on SWS (weekly contact hours) and course language available)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)

a) oral test (approx. 15 minutes) during experiment and b) ungraded written examination (approx. 90 minutes)

Allocation of places

Only as part of pool of general key skills (ASQ): 10 places. Places will be allocated by lot.

Additional information

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Workload

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