Julius-Maximilians-
UNIVERSITÄT
WÜRZBURG

Subdivided Module Catalogue

for the Subject

Biomedicine

as a Bachelor's with 1 major

with the degree "Bachelor of Science"

(180 ECTS credits)

Examination regulations version: 2009
Responsible: Faculty of Medicine
Responsible: Faculty of Biology

Course of Studies - Contents and Objectives

The bachelor's course of Biomedicine is provided by the Faculty of Medicine and the Faculty of Biology of the JMU as a course with a focus on basic research and a Bachelor of Science (B.Sc) degree. It is part of a consecutive bachelor and master program.

The object of this course is on the one hand to convey medical and scientific knowledge of the whole scope of medicine. On the other hand the students are prepared to use modern methods of molecular biology. In the process of studying the students acquire the necessary expertise and the abilities to conduct research. With a thesis the students prove their ability to process and represent a biomedical problem largely independent with a definite deadline and predetermined scientific methods.

Abbreviations used

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

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

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

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

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

Conventions

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

Notes

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

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

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

In accordance with

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

ASPO2009

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

01-Dec-2011 (2011-108)

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

Abbreviation	Module title	ECTS credits	Method of grading	page
Compulsory Courses (113 ECTS credits)				
Modules Biology (20 ECTS credits)				
07-3A3EBIOT-102-m01	Developmental Biology of Animals	4	NUM	57
07-1A1ZO-BM-102-m01	Biology I - From Cells to Organisms	8	NUM	53
07-2A2PH-BM-092-m01	Biology II - Physiology of Organisms, genetics, neurobiology and behaviour	8	NUM	55
Modules Chemistry (12 ECTS credits)				
08-CH-BM-102-m01	General chemistry for students of biomedicine	8	NUM	59
08-OC-BM-102-m01	Organic Chemistry 2 for students of biomedicine	4	NUM	61
Modules Physics (10 ECTS credits)				
11-EFNF-072-m01	Introduction to Physics for Students of Non-physics-related Minor Subjects	7	NUM	63
11-PFNF-072-m01	Practical Course Physics for Students of Non-physics-related Minor Subjects	3	B/NB	65
Modules Mathematics/Statistics (5 ECTS credits)				
10-M-STAB-111-m01	Statistics for students of natural sciences and biomedicine	5	NUM	62
Modules Biochemistry (21 ECTS credits)				
03-98-BCH-092-m01	Basic Biochemistry and Molecular Biology	11	NUM	11
03-98-BCHF-092-m01	Advanced Biochemistry and Molecular Biology	10	NUM	13
Modules Anatomy (10 ECTS credits)				
03-98-ANA-092-m01	Anatomy and Histology	10	NUM	7
Modules Physiology (10 ECTS credits)				
03-98-PHY-092-m01	Human Physiology 1+2	10	NUM	44
Modules Pharmacology and Toxicology (7 ECTS credits)				
03-98-APT-092-m01	Pharmacology and Toxicology	7	NUM	10
Modules Microbiology, Virology and Immunology (5 ECTS credits)				
03-98-MVI-092-m01	General Microbiology, Virology, Immunology	5	NUM	38
Modules Pathology (3 ECTS credits)				
03-98-APA-092-m01	Pathology	3	NUM	9
Modules Advanced Lab Course (10 ECTS credits)				
03-98-IPP-092-m01	Project work in research laboratory	10	B/NB	37
Thesis (12 ECTS credits)				
03-98-THK-092-m01	Bachelorthesis Biomedicine	12	NUM	52
Compulsory Electives (35 ECTS credits)				
Compulsory Electives I (5 ECTS credits)				
03-98-PZB-092-m01	Cell Biology	5	NUM	50
03-98-PGH-092-m01	Introduction to genetics and human genetics	5	NUM	41
Compulsory Electives II (5 ECTS credits)				
03-98-PZB-092-m01	Cell Biology	5	NUM	50
03-98-PGH-092-m01	Introduction to genetics and human genetics	5	NUM	41
07-MS2BI-092-m01	Bioinformatics	5	NUM	58
03-98-RVZ-092-m01	Introduction to methods in experimental biomedicine	5	NUM	51

03-98-PGN-092-m01	Introductory Neurobiology for students of biomedicine	5	NUM	42
Compulsory Electives III (10 ECTS credits)				
03-98-PIM-092-m01	Practical Course in Immunology for students of biomedicine	5	NUM	45
03-98-PMV-092-m01	Practical Course in Microbiology and Virology for students of biomedicine	5	NUM	47
03-98-PPC-092-m01	Pathophysiology and pathobiochemistry with clinical demonstrations for students of biomedicine	5	NUM	48
Compulsory Electives IV (15 ECTS credits)				
03-98-PZB-092-m01	Cell Biology	5	NUM	50
03-98-PGH-092-m01	Introduction to genetics and human genetics	5	NUM	41
07-MS2BI-092-m01	Bioinformatics	5	NUM	58
03-98-RVZ-092-m01	Introduction to methods in experimental biomedicine	5	NUM	51
03-98-PGN-092-m01	Introductory Neurobiology for students of biomedicine	5	NUM	42
03-98-PPT-092-m01	Practical Course in Pharmacology and Toxicology	5	NUM	49
03-98-PBG-092-m01	Bacterial genetics - Infectiology	5	NUM	39
03-98-PMP-092-m01	Parasitology	5	NUM	46
03-98-PGS-092-m01	Structural Biology	5	NUM	43
03-98-PF2-092-m01	Practical course in a research laboratory	5	NUM	40
Subject-specific Key Skills (15 ECTS credits)				
03-98-FSQ-FACH-092-m01	Laboratory Expertise in Biosciences	3	B/NB	23
03-98-FSQ-EPE-092-m01	From experiment to publication and ethics in science	2	B/NB	16
03-98-FSQ-STRA-092-m01	Radiation Safety and Protection	2	B/NB	33
03-98-FSQ-MB1-092-m01	Selected courses from biology and medicine 1	2	B/NB	29
03-98-FSQ-MB2-092-m01	Selected courses from biology and medicine 2	4	B/NB	30
03-98-FSQ-AF1-092-m01	Selected courses from other faculties with a biomedical focus 1	2	B/NB	14
03-98-FSQ-AF2-092-m01	Selected topics from other faculties with biomedical focus 2	4	B/NB	15
03-98-FSQ-TUT1-092-m01	Supervising Tutorials 1	2	B/NB	34
03-98-FSQ-TUT2-092-m01	Supervising Tutorials 2	3	B/NB	35
03-98-FSQ-TUT3-092-m01	Supervising Tutorials 3	5	B/NB	36
03-98-FSQ-LIT1-092-m01	Journal Club 1	2	B/NB	27
03-98-FSQ-LIT2-092-m01	Journal Club 2	4	B/NB	28
03-98-FSQ-KAR-092-m01	Careers in Science	1	B/NB	25
03-98-FSQ-EXK-092-m01	Excursion	1	B/NB	18
03-98-FSQ-F2PR-092-m01	Orientational Laboratory course	2	B/NB	19
03-98-FSQ-F2PR1-092-m01	Laboratory Course in biomedical research 1	3	B/NB	20
03-98-FSQ-F2PR2-092-m01	Laboratory Course in biomedical research 2	4	B/NB	21
03-98-FSQ-F2PR3-092-m01	Laboratory Course in biomedical research 3	5	B/NB	22

03-98-FSQ-LERN-092-m01	Learning strategies and preparation for exams	2	B/NB	26
03-98-FSQ-IKK-092-m01	Intercultural Competence	3	B/NB	24
03-98-FSQ-NETW-092-m01	Individual Competences for Science	3	B/NB	31

Module title			Abbreviation
Anatomy and Histology			03-98-ANA-092-m01
Module coordinator		**Module offered by**	
Institute of Anatomy and Cell 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	By way of exception, additional prerequisites are listed in the section on assessments.	

Contents

Anatomy I: musculoskeletal system, cranium, respiratory system, cardiovascular organs, digestive organs, urinary organs, sexual organs, brain. Part 1: cytology/histology. Part 2: microscopic anatomy. Anatomy II: organ systems, general and special anatomy of the digestive, cardiovascular, respiratory and urogenital organs and endocrine glands, central and peripheral nervous system, general and special histology, fundamentals of histopathology, general cytology and histology, microscopy of tissue sections, practical exercises.

Intended learning outcomes

The students are familiar with the foundations of general and special microscopic as well as macroscopic anatomy.

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.

- 03-98-ANA-1-092: S + Ü (no information on SWS (weekly contact hours) and course language available)
- 03-98-ANA-2-092: S + 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)

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 03-98-ANA-1-092: Anatomy and Cell Biology Anatomy and Cell Biology

- 5 ECTS, Method of grading: numerical grade
- a) written examination (approx. 60 minutes) and presentation (approx. 10 minutes) or b) oral examination of one candidate each (approx. 20 minutes) and presentation (approx. 10 minutes) or c) oral examination in groups of up to 3 candidates (approx. 20 minutes per candidate) and presentation (approx. 10 minutes)
- Assessment offered: once a year, winter semester
- Other prerequisites: Admission prerequisite to assessment: regular attendance of courses (lectures excluded) as specified at the beginning of the course.

Assessment in module component 03-98-ANA-2-092: Histology Histology Histology

- 5 ECTS, Method of grading: numerical grade
- a) 2 written examinations (approx. 60 minutes each) or b) oral examination of one candidate each (approx. 20 minutes) and presentation (approx. 10 minutes) or c) oral examination in groups of up to 3 candidates (approx. 20 minutes per candidate) and presentation (approx. 10 minutes)
- Assessment offered: once a year, summer semester
- Other prerequisites: Admission prerequisite to assessment: regular attendance of courses (lectures excluded) as specified at the beginning of the course.

Allocation of places

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Additional information

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Workload
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Teaching cycle
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Referred to in LPO I (examination regulations for teaching-degree programmes)
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Module appears in
Bachelor' degree (1 major) Biomedicine (2009)

Module title			Abbreviation
Pathology			03-98-APA-092-m01
Module coordinator		**Module offered by**	
holder of the Chair of Pathology		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
3	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

General and special pathology: pathology of cell damage, classification of inflammation, immunopathology, tumour pathology, examples of important organ diseases.

Intended learning outcomes

The students are familiar with the fundamental principles of general pathology and methods of pathology such as morphological, immunohistochemical, cytogenetic and molecular analyses. They have acquired a first insight into the pathogenesis, histopathology, macroscopic pathology and clinicopathologic correlations of cancer, inflammation, metabolic disorders and organ diseases.

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)

a) written examination (approx. 30 minutes) and presentation (approx. 10 minutes) or b) oral examination of one candidate each (approx. 20 minutes) and presentation (approx. 10 minutes) or c) oral examination in groups of up to 3 candidates (approx. 20 minutes per candidate) and presentation (approx. 10 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Biomedicine (2009)
Bachelor' degree (1 major) Biomedicine (2013)

Module title			Abbreviation
Pharmacology and Toxicology			03-98-APT-092-m01
Module coordinator		**Module offered by**	
holder of the Chair of Pharmacology and Toxicology		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
7	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
2 semester	undergraduate	Admission prerequisite to assessment: regular attendance of courses (lectures excluded) as specified at the beginning of the course.	

Contents

General pharmacology and toxicology, principles of pharmacodynamics and pharmacokinetics, drugs influencing the autonomous and central nervous systems, cardiovascular pharmacology, diuretics, anti-coagulative drugs, drugs affecting the gastrointestinal tract, analgesic drugs, hormonal treatment, drugs used in the treatment of infections and cancer, immune suppressive drugs, toxins, treatment of toxication.

Intended learning outcomes

Students have acquired a fundamental knowledge of general principles in pharmacology and toxicology. They have acquired specific knowledge of each named drug class, their mechanisms of action, basal pharmacokinetic properties and their most relevant side effects.

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)

a) written examination (approx. 60 minutes) and presentation (approx. 10 minutes) or b) oral examination of one candidate each (approx. 20 minutes) and presentation (approx. 10 minutes) or c) oral examination in groups of up to 3 candidates (approx. 20 minutes per candidate) and presentation (approx. 10 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Biomedicine (2009)
Bachelor' degree (1 major) Biomedicine (2013)

Module title			Abbreviation
Basic Biochemistry and Molecular Biology			03-98-BCH-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)**	
11	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
2 semester	undergraduate	Registration for the exercise must be made via SB@home at the beginning of the course or as announced by the lecturer in accordance with the specified registration deadlines. Certain prerequisites must be met to qualify for admission to assessment (e. g. successful completion of a certain percentage of exercises). The lecturer will inform students about the respective details at the beginning of the course. Registration for the exercise will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew and have to register anew, too.	

Contents

Biochemistry: structure and function of the building blocks of life, enzyme kinetics, biochemical analytics, fundamentals of intermediate and energy metabolism, mitochondrial function. Molecular biology: storage, transduction and expression of genetic information, control of cell functions by hormones and signal transduction processes, basic immunology. Performing biochemical detection reactions and molecular biology experiments.

Intended learning outcomes

Students gain an understanding of the foundations of human biochemistry and molecular biology. They develop the ability to prepare and present material on selected topics. They are proficient in the reproducible collection of simple biochemical and molecular biological data.

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

V + S + 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. 45 minutes) and 2 presentations (approx. 10 minutes each) or b) oral examination of one candidate each (approx. 20 minutes) and 2 presentations (approx. 10 minutes each) or c) oral examination in groups of up to 3 candidates (approx. 20 minutes per candidate) and 2 presentations (approx. 10 minutes each), weighted 6:1:1 (written/oral examination : presentation : presentation)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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Referred to in LPO I (examination regulations for teaching-degree programmes)
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Module appears in
Bachelor' degree (1 major) Biomedicine (2009) Bachelor' degree (1 major) Biomedicine (2013)

Module title			Abbreviation
Advanced Biochemistry and Molecular Biology			03-98-BCHF-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	Admission prerequisite to assessment: regular attendance of courses (lectures excluded) as specified at the beginning of the course.	

Contents

Enhanced insight into functional biochemical and molecular biological relationships. Examples of the molecular control of cell and organ functions. Application of molecular biology and genetic engineering methods to investigate cellular parameters such as gene expression patterns, protein expression or growth and apoptosis. Review of current literature on selected topics.

Intended learning outcomes

Students gain an advanced knowledge of functional biochemistry and molecular biology. They develop an understanding of the driving forces of normal and misguided cell functions and acquire practical routine in circumscribed experiments. Students gain an insight into the critical interpretation of experimental data.

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

V + S + 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. 45 minutes) and presentation (approx. 20 minutes) and log (5 to 10 pages) or b) oral examination of one candidate each (approx. 20 minutes) and presentation (approx. 20 minutes) and log (5 to 10 pages) or c) oral examination in groups of up to 3 candidates (approx. 20 minutes per candidate) and presentation (approx. 20 minutes) and log (5 to 10 pages), weighted 2:1:1 (written/oral examination : presentation : log)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Biomedicine (2009)
Bachelor' degree (1 major) Biomedicine (2013)

Module title			Abbreviation
Selected courses from other faculties with a biomedical focus 1			03-98-FSQ-AF1-092-m01
Module coordinator		**Module offered by**	
Dean of Studies Biomedizin (Biomedicine)		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
2	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	Admission prerequisite to assessment: regular attendance as specified at the beginning of the course. Prior approval by degree programme coordinator required.	

Contents

Courses, in particular in the area of natural sciences, offered by other Faculties that contribute to further professional qualification. Recognition (successfully completed/not successfully completed) as assessment to be granted by the module coordinator.

Intended learning outcomes

The students have acquired a broader range of knowledge that enables them to enhance their interdisciplinary thinking skills and improve their professional qualification.

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)

methods of assessment: a) written examination (45 to 60 minutes) or b) log (10 to 20 pages) or c) oral examination of one candidate each (approx. 20 minutes) or d) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or e) presentation (20 to 30 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Biomedicine (2009)
Bachelor' degree (1 major) Biomedicine (2013)

Module title			Abbreviation
Selected topics from other faculties with biomedical focus 2			03-98-FSQ-AF2-092-m01
Module coordinator		**Module offered by**	
Dean of Studies Biomedizin (Biomedicine)		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
4	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	Admission prerequisite to assessment: regular attendance as specified at the beginning of the course. Prior approval by degree programme coordinator required.	

Contents

Courses, in particular in the area of natural sciences, offered by other Faculties that contribute to further professional qualification. Recognition (successfully completed/not successfully completed) as assessment to be granted by the module coordinator.

Intended learning outcomes

The students have acquired a broader range of knowledge that enables them to enhance their interdisciplinary thinking skills and improve their professional qualification.

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)

methods of assessment: a) written examination (45 to 60 minutes) or b) log (10 to 20 pages) or c) oral examination of one candidate each (approx. 20 minutes) or d) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or e) presentation (20 to 30 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Biomedicine (2009)
Bachelor' degree (1 major) Biomedicine (2013)

Module title			Abbreviation
From experiment to publication and ethics in science			03-98-FSQ-EPE-092-m01
Module coordinator		**Module offered by**	
Dean of Studies Biomedizin (Biomedicine)		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
2	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	By way of exception, additional prerequisites are listed in the section on assessments.	

Contents

Writing scientific texts: definition of topic, development of structure and outline, content production, review of and comment on secondary literature, time management. Scientific ethics: general bioethics, ethics of research involving human subjects, ethical implications of genetic screening.

Intended learning outcomes

Students acquire fundamental insights into the steps from the generation of scientific data to their publication. They acquire an insight into the ethical implications of research with particular respect to genetic issues and human self-determination.

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.

- 03-98-FSQ-EXP-1-092: V (no information on SWS (weekly contact hours) and course language available)
- 03-98-FSQ-ETH-1-092: 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)

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 03-98-FSQ-EXP-1-092: From experiment to publication - how science works

- 1 ECTS, Method of grading: (not) successfully completed
- preparation of educational materials and materials for demonstrations (approx. 10 pages)
- Other prerequisites: Admission prerequisite to assessment: regular attendance as specified at the beginning of the course.

Assessment in module component 03-98-FSQ-ETH-1-092: Ethics in Science

- 1 ECTS, Method of grading: (not) successfully completed
- preparation of educational materials and materials for demonstrations (approx. 10 pages)
- Other prerequisites: Admission prerequisite to assessment: regular attendance as specified at the beginning of the course.

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in
Bachelor' degree (1 major) Biomedicine (2009)
Bachelor' degree (1 major) Biomedicine (2013)

Module title			Abbreviation
Excursion			03-98-FSQ-EXK-092-m01
Module coordinator		**Module offered by**	
Dean of Studies Biomedizin (Biomedicine)		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
1	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	Admission prerequisite to assessment: regular attendance of courses (lectures excluded) as specified at the beginning of the course. Prior approval by degree programme coordinator required.	
Contents			
Field trip to selected institutions or companies that are relevant to the life sciences.			
Intended learning outcomes			
Students make contact with industry and other potential employers.			
Courses (type, number of weekly contact hours, language — if other than German)			
E (no information on SWS (weekly contact hours) and course language available)			
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)			
report (1 to 2 pages)			
Allocation of places			
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Additional information			
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Workload			
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Teaching cycle			
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Referred to in LPO I (examination regulations for teaching-degree programmes)			
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Module appears in			
Bachelor' degree (1 major) Biomedicine (2009) Bachelor' degree (1 major) Biomedicine (2013)			

Module title			Abbreviation
Orientational Laboratory course			03-98-FSQ-F2PR-092-m01
Module coordinator		**Module offered by**	
Dean of Studies Biomedizin (Biomedicine)		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
2	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	Admission prerequisite to assessment: regular attendance of courses (lectures excluded) as specified at the beginning of the course.	
Contents			
Students spend 2 weeks at a laboratory and participate in routine work.			
Intended learning outcomes			
Students gain first insights into routine lab work and acquire new practical 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)			
log (5 to 10 pages)			
Allocation of places			
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Additional information			
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Workload			
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Teaching cycle			
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Referred to in LPO I (examination regulations for teaching-degree programmes)			
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Module appears in			
Bachelor' degree (1 major) Biomedicine (2009) Bachelor' degree (1 major) Biomedicine (2013)			

Module title			Abbreviation
Laboratory Course in biomedical research 1			03-98-FSQ-F2PR1-092-m01
Module coordinator		**Module offered by**	
Dean of Studies Biomedizin (Biomedicine)		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
3	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	Admission prerequisite to assessment: regular attendance of courses (lectures excluded) as specified at the beginning of the course.	

Contents

Students spend 2 weeks working on a small, well-defined scientific lab project.

Intended learning outcomes

Students reinforce previously acquired lab skills, acquire new lab techniques and learn how to apply theoretical knowledge in the lab. Students gain expertise in the analysis and presentation of raw data.

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 (5 to 10 pages)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Biomedicine (2009)
Bachelor' degree (1 major) Biomedicine (2013)

Module title			Abbreviation
Laboratory Course in biomedical research 2			03-98-FSQ-F2PR2-092-m01
Module coordinator		**Module offered by**	
Dean of Studies Biomedizin (Biomedicine)		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
4	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

Students spend 3 weeks working on a small, well-defined scientific lab project.

Intended learning outcomes

Students reinforce previously acquired lab skills, acquire new lab techniques and learn how to apply theoretical knowledge in the lab. Students gain expertise in the analysis and presentation of raw data.

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 (10 to 15 pages) and talk (approx. 10 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Biomedicine (2009)
Bachelor' degree (1 major) Biomedicine (2013)

Module title			Abbreviation
Laboratory Course in biomedical research 3			03-98-FSQ-F2PR3-092-m01
Module coordinator		**Module offered by**	
Dean of Studies Biomedizin (Biomedicine)		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	Admission prerequisite to assessment: regular attendance of courses (lectures excluded) as specified at the beginning of the course.	

Contents

Students spend 4 weeks working on a small, well-defined scientific lab project.

Intended learning outcomes

Students reinforce previously acquired lab skills, acquire new lab techniques and learn how to apply theoretical knowledge in the lab. Students gain expertise in the analysis and presentation of raw data.

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 (10 to 15 pages) and talk (approx. 10 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Biomedicine (2009)
Bachelor' degree (1 major) Biomedicine (2013)

Module title	Abbreviation
Laboratory Expertise in Biosciences	03-98-FSQ-FACH-092-m01

Module coordinator	Module offered by
holder of the Chair of Molecular Infection Biology and Animal Welfare Officer of the University of Würzburg	Faculty of Medicine

ECTS	Method of grading	Only after succ. compl. of module(s)
3	(not) successfully completed	--

Duration	Module level	Other prerequisites
1 semester	undergraduate	--

Contents

Part 1: Theoretical foundations of genetic engineering and genetic engineering safety regulations; applications of genetic engineering. Part 2: Theoretical and practical basic knowledge of animal welfare legislation, animal welfare ethics and laboratory animal science.

Intended learning outcomes

The students are familiar with methods of genetic engineering as well as relevant legal provisions regarding genetic engineering safety and biomaterials. They have the expertise to carry out or participate in animal experiments according to the guidelines of FELASA (Cat. B).

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.

- 03-98-FSQ-GEN-1-092: V (no information on SWS (weekly contact hours) and course language available)
- 03-98-FSQ-Tier-1-092: 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)

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 03-98-FSQ-GEN-1-092: Genetic Engineering and Biosafety

- 1 ECTS, Method of grading: (not) successfully completed
- written examination (approx. 15 minutes)

Assessment in module component 03-98-FSQ-Tier-1-092: Laboratory animal sciences Laboratory animal sciences

- 2 ECTS, Method of grading: (not) successfully completed
- written examination (approx. 30 to 60 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Biomedicine (2009)

Module title			Abbreviation
Intercultural Competence			03-98-FSQ-IKK-092-m01
Module coordinator		**Module offered by**	
Dean of Studies Biomedizin (Biomedicine)		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
3	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	Regular attendance of courses (lectures excluded) as specified at the beginning of the course is an admission prerequisite to assessment.	

Contents

Foundations of intercultural communication and culture-related communication problems, pathways to successful collaboration, international team building and conflict management.

Intended learning outcomes

Students have been sensitised to intercultural issues and are able to reflect on their own culture. They have developed a sensitivity towards cultural differences and potential points of friction.

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)

log (10 to 20 pages)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Biomedicine (2009)
Bachelor' degree (1 major) Biomedicine (2013)

Module title			Abbreviation
Careers in Science			03-98-FSQ-KAR-092-m01
Module coordinator		**Module offered by**	
Dean of Studies Biomedizin (Biomedicine)		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
1	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

The module outlines ways to plan and pursue an academic career. Information about the various career stages and career paths in science gives an overview of prospects. Different types of funding are discussed as well as examples of selected (women's) careers in science, also in relation to the reconciliation of work and family commitments.

Intended learning outcomes

The students acquire a fundamental knowledge of the different career paths in science up to professorships at universities in Germany and they are familiar with the respective requirements as well as essential sources of funding.

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)

preparation of educational materials and materials for demonstrations (approx. 10 pages)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Biomedicine (2009)
Bachelor' degree (1 major) Biomedicine (2013)

Module title			Abbreviation
Learning strategies and preparation for exams			03-98-FSQ-LERN-092-m01
Module coordinator		**Module offered by**	
Medical Psychology and Psychotherapy		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
2	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	Admission prerequisite to assessment: regular attendance of courses (as specified at the beginning of the course).	

Contents

This module will provide students with advice on how to independently organise their university studies as well as advice on learning strategies, learning techniques and time management. During a lecture series and an expert tutorial in workshop format, students will receive useful advice on exam preparation.

Intended learning outcomes

Students acquire learning skills and techniques to help them cope with the demands of their courses and prevent test anxiety by efficiently preparing for exams.

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)

presentation (approx. 15 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Biomedicine (2009)
Bachelor' degree (1 major) Biomedicine (2013)

Module title			Abbreviation
Journal Club 1			03-98-FSQ-LIT1-092-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)**	
2	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	Admission prerequisite to assessment: regular attendance of courses (lectures excluded) as specified at the beginning of the course.	

Contents

Students present selected recent publications and discuss their contents, methods and results within the group.

Intended learning outcomes

Students acquire the ability to critically read scientific literature, draw their own conclusions and to evaluate the results.

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. 15 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Biomedicine (2009)

Module title			Abbreviation
Journal Club 2			03-98-FSQ-LIT2-092-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)**	
4	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
2 semester	undergraduate	--	

Contents

Students present selected recent publications and discuss their contents, methods and results within the group.

Intended learning outcomes

Students acquire the ability to critically read scientific literature, draw their own conclusions and to evaluate the results.

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)

2 presentations (approx. 15 minutes each)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Biomedicine (2009)

Module title			Abbreviation
Selected courses from biology and medicine 1			03-98-FSQ-MB1-092-m01
Module coordinator		**Module offered by**	
Dean of Studies Biomedizin (Biomedicine)		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
2	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	Admission prerequisite to assessment: regular attendance as specified at the beginning of the course. Prior approval by degree programme coordinator required.	

Contents

Courses offered by the Faculties of Biology or Medicine that contribute to further professional qualification. Recognition (successfully completed/not successfully completed) as assessment to be granted by the module coordinator.

Intended learning outcomes

The students have acquired a broader range of knowledge that enables them to enhance their interdisciplinary thinking skills and improve their professional qualification.

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)

methods of assessment: a) written examination (45 to 60 minutes) or b) log (10 to 20 pages) or c) oral examination of one candidate each (approx. 20 minutes) or d) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or e) presentation (20 to 30 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Biomedicine (2009)
Bachelor' degree (1 major) Biomedicine (2013)

Module title			Abbreviation
Selected courses from biology and medicine 2			03-98-FSQ-MB2-092-m01
Module coordinator		**Module offered by**	
Dean of Studies Biomedizin (Biomedicine)		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
4	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	Admission prerequisite to assessment: regular attendance as specified at the beginning of the course. Prior approval by degree programme coordinator required.	

Contents

Courses offered by the Faculties of Biology or Medicine that contribute to further professional qualification. Recognition (successfully completed/not successfully completed) as assessment to be granted by the module coordinator.

Intended learning outcomes

The students have acquired a broader range of knowledge that enables them to enhance their interdisciplinary thinking skills and improve their professional qualification.

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)

methods of assessment: a) written examination (45 to 60 minutes) or b) log (10 to 20 pages) or c) oral examination of one candidate each (approx. 20 minutes) or d) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or e) presentation (20 to 30 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Biomedicine (2009)
Bachelor' degree (1 major) Biomedicine (2013)

Module title			Abbreviation
Individual Competences for Science			03-98-FSQ-NETW-092-m01
Module coordinator		**Module offered by**	
Dean of Studies Biomedizin (Biomedicine)		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
3	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	By way of exception, additional prerequisites are listed in the section on assessments.	

Contents

Identifying and formulating questions that are scientifically approachable, describing and explaining scientific phenomena and interpreting scientific evidence are key competences that are required, in addition to purely technical skills, to answer or solve scientific problems. Based on concrete examples, students interactively practise the respective skills in small groups and present their results.

Intended learning outcomes

In addition to honing their professional and methodological skills, the students develop and enhance their individual personal and interactive skills.

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.

- 03-98-FSQ-NETW-1-092: S (no information on SWS (weekly contact hours) and course language available)
- 03-98-FSQ-BEW-1-092: 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 03-98-FSQ-NETW-1-092: Personal skills and scientific networking

- 2 ECTS, Method of grading: (not) successfully completed
- term paper (5 to 10 pages) or preparation of educational materials and materials for demonstrations (approx. 10 pages)
- Other prerequisites: Admission prerequisite to assessment: regular attendance of courses (lectures excluded) as specified at the beginning of the course.

Assessment in module component 03-98-FSQ-BEW-1-092: Job Application in the Life Sciences

- 1 ECTS, Method of grading: (not) successfully completed
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- Other prerequisites: Admission prerequisite to assessment: regular attendance of courses (lectures excluded) as specified at the beginning of the course.

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in
Bachelor' degree (1 major) Biomedicine (2009)
Bachelor' degree (1 major) Biomedicine (2013)

Module title			Abbreviation
Radiation Safety and Protection			03-98-FSQ-STRA-092-m01
Module coordinator		**Module offered by**	
radiation protection commissioner of the University of Würzburg		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
2	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

Course to acquire radiation protection qualification in accordance with the *Strahlenschutzverordnung* (Radiation Protection Ordinance, StrlSchV).

Intended learning outcomes

Acquisition of formal expertise for handling open and sealed radioactive substances in accordance with the *Strahlenschutzverordnung* (Radiation Protection Ordinance, StrlSchV).

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)

2 written examinations (30 to 60 minutes each)

Allocation of places

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Additional information

Additional information on module duration: Courses will usually be offered in the form of a block course with two block sessions.

Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Biomedicine (2009)
Bachelor' degree (1 major) Biomedicine (2013)
First state examination for the teaching degree Gymnasium Physics (2009)

Module title			Abbreviation
Supervising Tutorials 1			03-98-FSQ-TUT1-092-m01
Module coordinator		**Module offered by**	
Dean of Studies Biomedizin (Biomedicine)		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
2	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	Prior approval by degree programme coordinator required.	

Contents

Students work as tutors. They support other students, in particular in the context of courses and study planning, and they participate as assistants in the organisation and planning of exercises and lab courses.

Intended learning outcomes

Tutors are able to communicate complex technical facts in a clear and structured way. They have gained experience in the supervision and motivation of groups, and they have practised applying conflict resolution strategies.

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)

log (2 to 3 pages)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Biomedicine (2009)
Bachelor' degree (1 major) Biomedicine (2013)

Module title			Abbreviation
Supervising Tutorials 2			03-98-FSQ-TUT2-092-m01
Module coordinator		**Module offered by**	
Dean of Studies Biomedizin (Biomedicine)		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
3	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	Prior approval by degree programme coordinator required.	

Contents

Students work as tutors. They support other students, in particular in the context of courses and study planning, and they participate as assistants in the organisation and planning of exercises and lab courses.

Intended learning outcomes

Tutors are able to communicate complex technical facts in a clear and structured way. They have gained experience in the supervision and motivation of groups, and they have practised applying conflict resolution strategies.

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)

log (2 to 3 pages)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Biomedicine (2009)
Bachelor' degree (1 major) Biomedicine (2013)

Module title			Abbreviation
Supervising Tutorials 3			03-98-FSQ-TUT3-092-m01
Module coordinator		**Module offered by**	
Dean of Studies Biomedizin (Biomedicine)		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	Prior approval by degree programme coordinator required.	

Contents

Students work as tutors. They support other students, in particular in the context of courses and study planning, and they participate as assistants in the organisation and planning of exercises and lab courses.

Intended learning outcomes

Tutors are able to communicate complex technical facts in a clear and structured way. They have gained experience in the supervision and motivation of groups, and they have practised applying conflict resolution strategies.

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)

log (2 to 3 pages)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Biomedicine (2009)
Bachelor' degree (1 major) Biomedicine (2013)

Module title			Abbreviation
Project work in research laboratory			03-98-IPP-092-m01
Module coordinator		**Module offered by**	
Dean of Studies Biomedizin (Biomedicine)		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	Admission prerequisite to assessment: regular attendance of courses (lectures excluded) as specified at the beginning of the course.	

Contents

Project work in a research laboratory focusing on training in new methods and the in-depth analysis of a scientific problem. This project may lay the foundation for a subsequent Bachelor's thesis.

Intended learning outcomes

Performing more complex experiments with sequential methods. Students gain an insight into new areas of research based on current literature and knowledge transfer.

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

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

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

log (10 to 15 pages) and presentation (approx. 15 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Biomedicine (2009)
Bachelor' degree (1 major) Biomedicine (2013)

Module title			Abbreviation
General Microbiology, Virology, Immunology			03-98-MVI-092-m01
Module coordinator		**Module offered by**	
holder of the Chair of Microbiology, holder of the Chair of Virology, holder of the Chair of Immunology		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

Foundations of virology, microbiology, immunology - part virology: virus families and selected topics; part microbiology: bacteriology, mycology and parasitology; part immunology: tasks, principles and components of the immune system, evolution.

Intended learning outcomes

The students will be introduced to scientific questions in virology, microbiology and immunology. They will acquire fundamental knowledge in these three subjects.

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

V + 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)

a) written examination (approx. 60 minutes) and presentation (approx. 10 minutes) or b) oral examination of one candidate each (approx. 20 minutes) and presentation (approx. 10 minutes) or c) oral examination in groups of up to 3 candidates (approx. 20 minutes per candidate) and presentation (approx. 10 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Biomedicine (2009)
Bachelor' degree (1 major) Biomedicine (2013)

Module title			Abbreviation
Bacterial genetics - Infectiology			03-98-PBG-092-m01
Module coordinator		**Module offered by**	
Institute of Molecular Infection Biology		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	Admission prerequisite to assessment: regular attendance of courses (lectures excluded) as specified at the beginning of the course.	

Contents

Foundations and analytical approaches of bacterial genetics are taught based on selected questions from molecular microbiology. Genetic processes are analysed with the help of examples of gene transfer. Molecular genetic and functional biochemical pathways are presented using examples from microbiology.

Intended learning outcomes

Students have developed the ability to approach, analyse and interpret general problems in bacterial genetics based on individually assigned tasks, using techniques of modern molecular biology, microbiology and genetics. 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 + S + 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)

methods of assessment: a) written examination (45 to 60 minutes) or b) log (10 to 20 pages) or c) oral examination of one candidate each (approx. 20 minutes) or d) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or e) presentation (20 to 30 minutes)

Allocation of places

Biochemistry Bachelor's: no restrictions. Biochemistry Master's: 4 places. Places will be allocated by lot.

Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Biomedicine (2009)
Bachelor' degree (1 major) Biomedicine (2013)
Master's degree (1 major) Biochemistry (2012)

Module title			Abbreviation
Practical course in a research laboratory			03-98-PF2-092-m01
Module coordinator		**Module offered by**	
Dean of Studies Biomedizin (Biomedicine)		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	Prior approval by degree programme coordinator required. Regular attendance of courses (lectures excluded) as specified at the beginning of the course is an admission prerequisite to assessment.	

Contents

Working in a research laboratory under individual supervision. The topic will vary according to the lab selected.

Intended learning outcomes

Students expand their repertoire of experimental methods and learn how to critically examine experimental data. They become familiar with workflows and organisational patterns in research laboratories.

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 (5 to 10 pages) and presentation (approx. 10 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Biomedicine (2009)

Module title	Abbreviation
Introduction to genetics and human genetics	03-98-PGH-092-m01

Module coordinator	Module offered by
holder of the Chair of Clinical Biochemistry and Pathobiochemistry and holder of the Chair of Neurobiology and Genetics and Research Center for Infectious Diseases	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

Introduction to human genetics, general genetics and genetic diagnostics in human diseases: diseases caused by genetic instability, neurodegenerative diseases, hereditary cancer. Practical part: molecular genetic diagnosis, genetics of trypanosomes, genetic tools in Drosophila, optogenetics and thermogenetics.

Intended learning outcomes

Students will acquire a fundamental knowledge of human, trypanosome and Drosophila genetics as well as molecular genetic diagnostics and genetic counselling. They will develop an advanced knowledge of the genetics of selected diseases.

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

P + 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)

methods of assessment: a) written examination (45 to 60 minutes) or b) log (10 to 20 pages) or c) oral examination of one candidate each (approx. 20 minutes) or d) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or e) presentation (20 to 30 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Biomedicine (2009)
Bachelor' degree (1 major) Biomedicine (2013)

Module title			Abbreviation
Introductory Neurobiology for students of biomedicine			03-98-PGN-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)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	Admission prerequisite to assessment: regular attendance of courses (lectures excluded) as specified at the beginning of the course.	

Contents

General fundamentals of neuroanatomy, important methods in neurobiology, diseases of the nervous system: symptoms, diagnosis, therapeutic options, discussion of novel research results.

Intended learning outcomes

Students who successfully completed this module have acquired a fundamental knowledge about the structure and function of the nervous system. Giving oral presentations, they have developed the ability to critically reflect and discuss current scientific research results in the context of the field of neurobiology.

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

V + S + 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)

methods of assessment: a) written examination (45 to 60 minutes) or b) log (10 to 20 pages) or c) oral examination of one candidate each (approx. 20 minutes) or d) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or e) presentation (20 to 30 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Biochemistry (2011)
Bachelor' degree (1 major) Biochemistry (2013)
Bachelor' degree (1 major) Biochemistry (2009)
Bachelor' degree (1 major) Biomedicine (2009)
Bachelor' degree (1 major) Biomedicine (2013)

Module title			Abbreviation
Structural Biology			03-98-PGS-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)**	
5	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)

V + S + 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)

methods of assessment: a) written examination (45 to 60 minutes) or b) log (10 to 20 pages) or c) oral examination of one candidate each (approx. 20 minutes) or d) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or e) presentation (20 to 30 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Biomedicine (2009)
Bachelor' degree (1 major) Biomedicine (2013)

Module title			Abbreviation
Human Physiology 1+2			03-98-PHY-092-m01
Module coordinator		**Module offered by**	
holders of the Chairs of Cardiovascular Physiology and Neurophysiology		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
2 semester	undergraduate	Admission prerequisite to assessment: regular attendance of courses (lectures excluded) as specified at the beginning of the course.	

Contents

Fundamental principles of physiology and pathophysiology: 1. functions of blood, energy balance and carbohydrate metabolism, nerves and muscles, hearing and vestibular apparatus, eyes and vision; 2. functionality of the cardiovascular system, mechanics of breathing, kidney function and electrolyte balance, acid-base balance.

Intended learning outcomes

Students gain a fundamental knowledge of human physiology and pathophysiology. They develop the ability to understand physiological principles and learn to conduct functional analyses of physiological processes.

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

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

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

2 written examinations (approx. 60 minutes each)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Biomedicine (2009)
Bachelor' degree (1 major) Biomedicine (2013)

Module title			Abbreviation
Practical Course in Immunology for students of biomedicine			03-98-PIM-092-m01
Module coordinator		**Module offered by**	
holder of the Professorship of Immune Regulation		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	Admission prerequisite to assessment: regular attendance of courses (lectures excluded) as specified at the beginning of the course.	

Contents

How antigen recognition, uptake and presentation by dendritic cells lead to induction of activation markers, transcription factors, cytokines and proliferation of CD4+ T lymphocytes.

Intended learning outcomes

The students acquire theoretical and practical knowledge about mechanisms that cells of the innate immune system use to sense pathogens and how this information is translated in the activation of T lymphocytes. They learn fundamental techniques of sterile cell culture, flow cytometry and confocal microscopy analysis techniques and ELISA.

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

P + 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)

methods of assessment: a) written examination (45 to 60 minutes) or b) log (10 to 20 pages) or c) oral examination of one candidate each (approx. 20 minutes) or d) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or e) presentation (20 to 30 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Biomedicine (2009)

Module title			Abbreviation
Parasitology			03-98-PMP-092-m01
Module coordinator		**Module offered by**	
holder of the Professorship of Medicinical Parasitology and holder of the Professorship of Zoology I		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	Admission prerequisite to assessment: regular attendance of courses (lectures excluded) as specified at the beginning of the course.	

Contents

Methods for in vitro cultivation of parasitic helminths and free-living reference models. Genomic and transcriptomic analyses of helminth parasites. Virulence factors of helminth parasites and drug design and development of novel anthelminthics. Methods for the cell biological and genetic analysis of African trypanosomes. The focus is on the cell surface coat as major virulence factor and its manipulation by RNA interference.

Intended learning outcomes

The students are familiar with fundamental methods for the development of drugs against helminths. The students are familiar with the principles of helminthology diagnostics as well as helminth genomics/transcriptomics. The students are familiar with the concept of neglected tropical diseases with an emphasis on the African sleeping sickness. They recognise the potential of modern genetic tools for the generation of novel strategies against diseases of poverty caused by parasites.

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

V + S + 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)

methods of assessment: a) written examination (45 to 60 minutes) or b) log (10 to 20 pages) or c) oral examination of one candidate each (approx. 20 minutes) or d) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or e) presentation (20 to 30 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Biomedicine (2009)
Bachelor' degree (1 major) Biomedicine (2013)

Module title	Abbreviation
Practical Course in Microbiology and Virology for students of biomedicine	03-98-PMV-092-m01

Module coordinator	Module offered by
holder of the Professorship of Parasitology, 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	Admission prerequisite to assessment: regular attendance of courses (lectures excluded) as specified at the beginning of the course.

Contents

Part microbiology: fundamental principles of the interaction of bacterial pathogens and multicellular parasites with host organisms; invasion of mammalian cells by intracellular bacteria as well as the regulation and mode of action of bacterial virulence factors; fundamental principles of microbial diagnostics. Part virology: fundamental methods to demonstrate viral infections and to recognise viral pathogenesis using the microscope.

Intended learning outcomes

Section microbiology: Students will acquire theoretical and practical knowledge on bacterial virulence factors, their regulation and mode of action in the context of infectious disease, including the invasion of eukaryotic host cells by bacterial pathogens and the multiplication and persistence of bacteria within host cells. The students will become familiar with fundamental principles of the cultivation of bacteria and multicellular parasites under laboratory conditions as well as the utilisation of these cultivation systems for the development of novel antiinfectives. The students will become familiar with the principles of microbial diagnostics, including microbial cultivation as well as DNA-based, microscopical, serological and physiological methods of diagnostic differentiation medical microbiology and hygiene. They will be able to set up experiments and to analyse and interpret data. Section virology: Practical knowledge on the detection of viral infections and pathogenetic alterations following viral infections.

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

P + 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)

methods of assessment: a) written examination (45 to 60 minutes) or b) log (10 to 20 pages) or c) oral examination of one candidate each (approx. 20 minutes) or d) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or e) presentation (20 to 30 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Biomedicine (2009)
Bachelor' degree (1 major) Biomedicine (2013)

Module title			Abbreviation
Pathophysiology and pathobiochemistry with clinical demonstrations for students of biomedicine			03-98-PPC-092-m01
Module coordinator		**Module offered by**	
holder of the Professorship Clinical Biochemistry at the Rudolf Virchow Center for Experimental Biomedicine		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	Admission prerequisite to assessment: regular attendance of clinical demonstrations as specified at the beginning of the course.	

Contents

The lecture series will cover the pathobiochemistry and pathophysiology of selected diseases from nephrology, cardiology, endocrinology, pneumology, psychiatry and aspects of clinical molecular biology. The focus is on the biochemical and molecular causes of these diseases and the challenges for respective clinical diagnosis, treatment and translational research.

Intended learning outcomes

Students gain an understanding of how knowledge of pathobiochemical and pathophysiological disease processes translates into clinical diagnosis and treatment.

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)

methods of assessment: a) written examination (45 to 60 minutes) or b) log (10 to 20 pages) or c) oral examination of one candidate each (approx. 20 minutes) or d) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or e) presentation (20 to 30 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Biomedicine (2009)
Bachelor' degree (1 major) Biomedicine (2013)

Module title			Abbreviation
Practical Course in Pharmacology and Toxicology			03-98-PPT-092-m01
Module coordinator		**Module offered by**	
holder of the Chair of Pharmacology and Toxicology		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	Admission prerequisite to assessment: regular attendance of courses (lectures excluded) as specified at the beginning of the course.	

Contents

Fundamental pharmacological and toxicological techniques: membrane preparation, radioligand binding, pharmacology of the heart, cell culture and transfection, assessment of DNA damage by micro adducts, comet-assay etc.

Intended learning outcomes

At the end of the course, students will be able to perform routine pharmacological and toxicological techniques. They will also be able to perform microscopic analyses of samples, the functional characterisation of selected target proteins and cell toxicity analyses.

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

P + 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)

oral examination in groups of up to 3 candidates in the form of a presentation (approx. 30 minutes) and preparation of a scientific publication (approx. 1.5 hours)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Biomedicine (2009)
Bachelor' degree (1 major) Biomedicine (2013)

Module title			Abbreviation
Cell Biology			03-98-PZB-092-m01
Module coordinator		**Module offered by**	
holder of the Chair of Medical Radiation and Cell Research		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

Becoming familiar with basic cell biological principles via hands-on training and seminars. Major topics are the structural organisation of eukaryotic cells, cell-cell and cell-matrix interactions, proliferation, differentiation and apoptosis.

Intended learning outcomes

Problem-oriented handling of eukaryotic cells under sterile conditions and understanding of principles of techniques for the analysis of cells. Understanding the molecular basis of cell biology and cellular malfunctions and their significance for disease development. Independent extraction of relevant information and presentation of selected examples of current literature.

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

R + 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)

methods of assessment: a) written examination (45 to 60 minutes) or b) log (10 to 20 pages) or c) oral examination of one candidate each (approx. 20 minutes) or d) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or e) presentation (20 to 30 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Biomedicine (2009)
Bachelor' degree (1 major) Biomedicine (2013)

Module title			Abbreviation
Introduction to methods in experimental biomedicine			03-98-RVZ-092-m01
Module coordinator		**Module offered by**	
holder of the Chair of Experimental Biomedicine		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

Fundamental knowledge and analytical approaches of experimental biomedicine are taught based on selected questions of platelet physiology and megakaryopoiesis. Emphasis is put on the generation and use of antibodies. Transgenic mouse models are used to elucidate the interplay underlying (patho-)physiological processes.

Intended learning outcomes

Students have developed the ability to approach, analyse and interpret experimental data obtained with the help of monoclonal antibodies, in particular in the field of platelet physiology. They also have developed skills in experimental design, bench work, data analysis and the interpretation of scientific literature as well as the presentation of scientific results in English.

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)

methods of assessment: a) written examination (45 to 60 minutes) or b) log (10 to 20 pages) or c) oral examination of one candidate each (approx. 20 minutes) or d) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) or e) presentation (20 to 30 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Biomedicine (2009)
Bachelor' degree (1 major) Biomedicine (2013)

Module title			Abbreviation
Bachelorthesis Biomedicine			03-98-THK-092-m01
Module coordinator		**Module offered by**	
chairperson of examination committee Biomedizin (Biomedicine)		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
12	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

Conduct a defined and focused research project under supervision within a limited time frame.

Intended learning outcomes

Students demonstrate their ability to solve a defined problem within a chosen area within a given time frame by applying scientific research methods.

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

This module has 2 components; information on courses listed separately for each component.

- 03-98-THK-2-092: K (no information on language and number of weekly contact hours available)
- 03-98-THK-1-092: A (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 2 assessment components. Unless stated otherwise, students must pass all of these assessment components to pass the module as a whole..

Assessment component to module component 03-98-THK-2-092: Kolloquium

- 2 ECTS credits, method of grading: numerical grade
- oral examination of on candidate each (approx. 20 minutes)

Assessment component to module component 03-98-THK-1-092: Bachelorthesis Biomedizin

- 10 ECTS credits, method of grading: numerical grade
- written thesis (20-40 pages)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Biomedicine (2009)

Module title			Abbreviation
Biology I - From Cells to Organisms			07-1A1ZO-BM-102-m01
Module coordinator		**Module offered by**	
Dean of Studies Biologie (Biology)		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
8	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.

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.

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-4T-072: V + Ü (no information on language and number of weekly contact hours available)
- 07-1A1ZO-NF-1Z-082, 07-1A1ZO-2E-BM-102, and 07-1A1ZO-3P-BM-092: V (no information on language and number of weekly contact hours available)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module 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-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-NF-1Z-082: Die Zelle für das Nebenfach Biologie (The Cell for Biology Minors)

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

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

- 1 ECTS credit, pass / fail
- written examination (approx. 30 minutes) including multiple choice questions

Assessment in module component 07-1A1ZO-3P-BM-092: Das Pflanzenreich (The Plant Kingdom)
- 2 ECTS credits, numerical grading
- written examination (approx. 60 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Biomedicine (2009)

Module title			Abbreviation
Biology II - Physiology of Organisms, genetics, neurobiology and behaviour			07-2A2PH-BM-092-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)**	
8	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 6 module components. Information on courses will be listed separately for each module component.

- 07-2A2PH-3TI-072: V + Ü (no information on SWS (weekly contact hours) and course language available)
- 07-2A2PH-1PR-BM-092: V (no information on SWS (weekly contact hours) and course language available)
- 07-2A2PH2PF-BM-092: V (no information on SWS (weekly contact hours) and course language available)
- 07-2A2GNV-1G-BM-092: V (no information on SWS (weekly contact hours) and course language available)
- 07-2A2GNV-2N-BM-092: V (no information on SWS (weekly contact hours) and course language available)
- 07-2A2GNV-3V-BM-092: 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)

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-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.

Assessment in module component 07-2A2PH-1PR-BM-092: Basic Physiology of Prokaryotes

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

Assessment in module component 07-2A2PH2PF-BM-092: Plant Physiology

- 1 ECTS, Method of grading: numerical grade
- written examination (approx. 45 minutes)

Assessment in module component 07-2A2GNV-1G-BM-092: Basic Genetics

- 1 ECTS, Method of grading: numerical grade
- written examination (approx. 30 minutes)

Assessment in module component 07-2A2GNV-2N-BM-092: Basic Neurobiology

- 1 ECTS, Method of grading: numerical grade
- written examination (approx. 30 minutes)

Assessment in module component 07-2A2GNV-3V-BM-092: Behavioural Biology

- 1 ECTS, Method of grading: numerical grade

• written examination (approx. 30 minutes, word problems and/or multiple choice questions)
Allocation of places
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Additional information
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Workload
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Teaching cycle
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Referred to in LPO I (examination regulations for teaching-degree programmes)
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Module appears in
Bachelor' degree (1 major) Biomedicine (2009)

Module title			Abbreviation
Developmental Biology of Animals			07-3A3EBIOT-102-m01
Module coordinator		**Module offered by**	
Dean of Studies Biologie (Biology)		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
4	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	Admission prerequisite to assessment: regular attendance of exercises and successful completion of the respective exercises as specified at the beginning of the course.	

Contents

In this module, students will acquire theoretical and practical background knowledge on animal developmental biology. The following topics will be covered: early embryonic development of various model organisms (amphibians, nematodes, Drosophila, mouse) and relevance for the systematics of animals, gametogenesis (production of spermatozoa and ova), differential gene expression, cell growth and molecular regulation of cell development, organogenesis, pattern formation, carcinogenesis, stem cell research and cloning, metamorphosis (amphibians, insects), eco-devo, evo-devo.

Intended learning outcomes

1. Fundamental concepts in developmental biology. 2. Embryonic and postembryonic development of selected model organisms (pattern formation). 3. Molecular mechanisms as well as control of cell development. 4. Interdisciplinary connections between developmal biology and other branches of biology. 5. Cell biology of cotyledon, cancer and stem cells as well as gametes. 6. Interrelations between ontogeny and evolution/environment. 7. Physiological aspects of the developmental processes discussed.

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

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

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

written examination (approx. 30 to 60 minutes) including multiple choice questions

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Mathematics (2012)
Bachelor' degree (1 major) Mathematics (2013)
Bachelor' degree (1 major) Biomedicine (2009)
Bachelor' degree (1 major) Computational Mathematics (2012)
Bachelor' degree (1 major) Computational Mathematics (2013)
Bachelor's degree (1 major, 1 minor) Biology (Minor, 2010)

Module title			Abbreviation
Bioinformatics			07-MS2BI-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	graduate	--	

Contents

Advances and current results of bioinformatics are explained and discussed, this includes results from genome and sequence analysis, protein domains and protein families, large-scale data analysis (e. g. net generation sequences, proteomics data), analysis of different functional RNAs (e. g. miRNAs, lncRNAs).

Intended learning outcomes

Understand recent results in bioinformatics. Discuss their implications. Have an advanced (Master) level knowledge of typical technologies and research questions in bioinformatics.

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 (30 to 60 minutes) and/or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Biomedicine (2009)
Bachelor' degree (1 major) Biomedicine (2013)

Module title			Abbreviation
General chemistry for students of biomedicine			08-CH-BM-102-m01
Module coordinator		**Module offered by**	
Dean of Studies Chemie (Chemistry)		Institute of Organic Chemistry	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
8	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

This module discusses the fundamental principles of both inorganic and organic chemistry. The lab course gives students the opportunity to learn essential methods and perform simple experiments.

Intended learning outcomes

Students are able to explain the principles of the periodic table and to extract information from it. They are able to explain basic models of the structure of matter. They have developed the ability to use the language of chemical formulas to describe chemical reactions and to interpret them by identifying the type of reaction. 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-AC-NF-1-102: V (no information on SWS (weekly contact hours) and course language available)
- 08-IOC-1-102: V (no information on SWS (weekly contact hours) and course language available)
- 08-CH-BMP-1-102: 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-1-102: Introduction to Inorganic Chemistry for Students of Biology, Medicine and Dentistry

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

Assessment in module component 08-IOC-1-102: 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-CH-BMP-1-102: Practical chemistry course for students of biomedicine

- 2 ECTS, Method of grading: (not) successfully completed
- pre/post-experiment examination talks (Vor-/Nachtestate, approx. 15 minutes each), log (approx. 2 to 5 pages)
- Assessment offered: once a year, summer semester
- Only after successful completion of module components: Successful completion of module component 08-AC-NF-1 or 08-IOC-1 is a prerequisite for participation in module component 08-CH-BMP-1.

Allocation of places

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

- 08-CH-BMP-1-102: --
- 08-AC-NF-1-102: Only as part of pool of general key skills (ASQ): 15 places. Places will be allocated by lot.
- 08-IOC-1-102: Only as part of pool of general key skills (ASQ): 15 places. Places will be allocated by lot.

Additional information

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Workload
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Teaching cycle
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Referred to in LPO I (examination regulations for teaching-degree programmes)
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Module appears in
Bachelor' degree (1 major) Biomedicine (2009) Bachelor' degree (1 major) Biomedicine (2013)

Module title			Abbreviation
Organic Chemistry 2 for students of biomedicine			08-OC-BM-102-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)**	
4	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	undergraduate	--	

Contents

This module deals with the fundamental principles of organic chemistry.

Intended learning outcomes

Students have developed a knowledge of the fundamental principles of organic chemistry and are able to apply that knowledge to research problems.

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)

a) 1 to 3 written examinations (1 written examination: approx. 90 minutes; 2 written examinations: 60 or 90 minutes each; 3 written examinations: 60 minutes each) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups (approx. 30 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Biomedicine (2009)
Bachelor' degree (1 major) Biomedicine (2013)

Module title			Abbreviation
Statistics for students of natural sciences and biomedicine			10-M-STAB-111-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	Registration for the exercise must be made via SB@home at the beginning of the course or as announced by the lecturer in accordance with the specified registration deadlines. Certain prerequisites must be met to qualify for admission to assessment (e. g. successful completion of a certain percentage of exercises). The lecturer will inform students about the respective details at the beginning of the course. Registration for the exercise will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew and have to register anew, too.	

Contents

Basics of statistics: descriptive statistics, probability theory, deductive statistics.

Intended learning outcomes

The student is able to utilise basic statistical methods for the evalutation of data 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)

written examination (90 to 120 minutes)
Language of assessment: German, English if agreed upon with the examiner

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Biomedicine (2009)
Bachelor' degree (1 major) Biomedicine (2013)

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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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Biochemistry (2011)
Bachelor' degree (1 major) Biochemistry (2013)
Bachelor' degree (1 major) Biochemistry (2009)
Bachelor' degree (1 major) Biology (2011)
Bachelor' degree (1 major) Biology (2007)
Bachelor' degree (1 major) Biology (2010)
Bachelor' degree (1 major) Chemistry (2007)
Bachelor' degree (1 major) Chemistry (2008)
Bachelor' degree (1 major) Chemistry (2010)
Bachelor' degree (1 major) Chemistry (2009)
Bachelor' degree (1 major) Geography (2007)
Bachelor' degree (1 major) Geography (2008)
Bachelor' degree (1 major) Geography (2010)
Bachelor' degree (1 major) Computer Science (2007)
Bachelor' degree (1 major) Computer Science (2014)
Bachelor' degree (1 major) Computer Science (2010)
Bachelor' degree (1 major) Food Chemistry (2009)
Bachelor' degree (1 major) Mathematics (2008)
Bachelor' 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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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Biochemistry (2011)
Bachelor' degree (1 major) Biochemistry (2013)
Bachelor' degree (1 major) Biochemistry (2009)
Bachelor' degree (1 major) Biology (2011)
Bachelor' degree (1 major) Biology (2007)
Bachelor' degree (1 major) Biology (2010)
Bachelor' degree (1 major) Chemistry (2007)
Bachelor' degree (1 major) Chemistry (2008)
Bachelor' degree (1 major) Chemistry (2010)
Bachelor' degree (1 major) Chemistry (2009)
Bachelor' degree (1 major) Geography (2007)
Bachelor' degree (1 major) Geography (2008)
Bachelor' degree (1 major) Geography (2010)
Bachelor' degree (1 major) Computer Science (2007)
Bachelor' degree (1 major) Computer Science (2014)
Bachelor' degree (1 major) Computer Science (2010)
Bachelor' degree (1 major) Food Chemistry (2009)
Bachelor' degree (1 major) Biomedicine (2009)

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