

# 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

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## The subject is divided into

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Modules Microbiology, Virology and Immunology	5	36
Modules Pathology	3	38
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Thesis	12	42
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## Content and Objectives of the Programme

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.

## Compulsory Courses

(113 ECTS credits)

## **Modules Biology**

(20 ECTS credits)



Module title		Abbreviation
Developmental Biology of Animals		07-3A3EBIOT-102-m01
Module coordinator		Module offered by
Dean of Studies Biologie (Biology)		Faculty of Biology
ECTS	Method of grading	Only after succ. compl. of module(s)
4	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: regular attendance of exercises and successful completion of the respective exercises as specified at the beginning of the course.
Contents		
In this module, students will acquire theoretical and practical background knowledge on animal developmental biology. The following topics will be covered: early embryonic development of various model organisms (amphibians, nematodes, Drosophila, mouse) and relevance for the systematics of animals, gametogenesis (production of spermatozoa and ova), differential gene expression, cell growth and molecular regulation of cell development, organogenesis, pattern formation, carcinogenesis, stem cell research and cloning, metamorphosis (amphibians, insects), eco-devo, evo-devo.		
Intended learning outcomes		
1. Fundamental concepts in developmental biology. 2. Embryonic and postembryonic development of selected model organisms (pattern formation). 3. Molecular mechanisms as well as control of cell development. 4. Interdisciplinary connections between developmental biology and other branches of biology. 5. Cell biology of cotyledon, cancer and stem cells as well as gametes. 6. Interrelations between ontogeny and evolution/environment. 7. Physiological aspects of the developmental processes discussed.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 30 to 60 minutes) including multiple choice questions		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Biomedicine (2009) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) Bachelor's degree (1 major, 1 minor) Biology (Minor, 2010)		

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, archaeobacteria) and eukaryotic cells (animals, plants). The second part will address one of the central issues of biology: evolution. Fundamental mechanisms and hypotheses will be discussed and students will be introduced to major phylogenetic reconstruction methods. Using the examples of plants and animals, the subsequent module components will introduce students to the phylogenetic diversity of eukaryotes. At the level of groups in the plant and animal kingdoms, students will acquire the fundamental knowledge necessary to understand the forms and functions of animal and plant organisms, with morphology and cytology being discussed in an evolutionary and ecological context. The contents of the module are relevant for biological disciplines at all levels of biological organisation.			
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. <ul style="list-style-type: none"><li>07-1A1ZO-4T-072: V + Ü (no information on language and number of weekly contact hours available)</li><li>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)</li></ul>			
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)			
This module has the following 4 assessment components. Unless stated otherwise, students must pass all of these assessment components to pass the module as a whole.			
<b>Assessment in module component 07-1A1ZO-4T-072: Das Tierreich (The Animal Kingdom)</b> <ul style="list-style-type: none"><li>4 ECTS credits, numerical grading</li><li>written examination (approx. 60 minutes)</li><li>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.</li></ul>			
<b>Assessment in module component 07-1A1ZO-NF-1Z-082: Die Zelle für das Nebenfach Biologie (The Cell for Biology Minors)</b> <ul style="list-style-type: none"><li>1 ECTS credit, numerical grading</li><li>written examination (approx. 60 minutes) including multiple choice questions</li></ul>			
<b>Assessment in module component 07-1A1ZO-2E-BM-102: Evolution</b> <ul style="list-style-type: none"><li>1 ECTS credit, pass / fail</li></ul>			
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<ul style="list-style-type: none"> <li>written examination (approx. 30 minutes) including multiple choice questions</li> </ul>
<b>Assessment in module component 07-1A1ZO-3P-BM-092: Das Pflanzenreich (The Plant Kingdom)</b>
<ul style="list-style-type: none"> <li>2 ECTS credits, numerical grading</li> <li>written examination (approx. 60 minutes)</li> </ul>
<b>Allocation of places</b>
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<b>Additional information</b>
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<b>Workload</b>
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<b>Teaching cycle</b>
--
<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)
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<b>Module appears in</b>
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. <ul style="list-style-type: none"><li>• 07-2A2PH-3TI-072: V + Ü (no information on SWS (weekly contact hours) and course language available)</li><li>• 07-2A2PH-1PR-BM-092: V (no information on SWS (weekly contact hours) and course language available)</li><li>• 07-2A2PH2PF-BM-092: V (no information on SWS (weekly contact hours) and course language available)</li><li>• 07-2A2GNV-1G-BM-092: V (no information on SWS (weekly contact hours) and course language available)</li><li>• 07-2A2GNV-2N-BM-092: V (no information on SWS (weekly contact hours) and course language available)</li><li>• 07-2A2GNV-3V-BM-092: V (no information on SWS (weekly contact hours) and course language available)</li></ul>			
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)			
Assessment in this module comprises the assessments in the individual module components as specified below. Unless stated otherwise, successful completion of the module will require successful completion of all individual assessments.			
<b>Assessment in module component 07-2A2PH-3TI-072: Animal Physiology</b> Animal Physiology <ul style="list-style-type: none"><li>• 3 ECTS, Method of grading: numerical grade</li><li>• written examination (approx. 60 minutes, word problems and/or multiple choice questions)</li><li>• 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.</li></ul>			
<b>Assessment in module component 07-2A2PH-1PR-BM-092: Basic Physiology of Prokaryotes</b> Basic Physiology of Prokaryotes <ul style="list-style-type: none"><li>• 1 ECTS, Method of grading: numerical grade</li><li>• written examination (approx. 60 minutes) including multiple choice questions</li></ul>			
<b>Assessment in module component 07-2A2PH2PF-BM-092: Plant Physiology</b> Plant Physiology <ul style="list-style-type: none"><li>• 1 ECTS, Method of grading: numerical grade</li><li>• written examination (approx. 45 minutes)</li></ul>			
<b>Assessment in module component 07-2A2GNV-1G-BM-092: Basic Genetics</b> Basic Genetics <ul style="list-style-type: none"><li>• 1 ECTS, Method of grading: numerical grade</li><li>• written examination (approx. 30 minutes)</li></ul>			
<b>Assessment in module component 07-2A2GNV-2N-BM-092: Basic Neurobiology</b> Basic Neurobiology <ul style="list-style-type: none"><li>• 1 ECTS, Method of grading: numerical grade</li><li>• written examination (approx. 30 minutes)</li></ul>			
<b>Assessment in module component 07-2A2GNV-3V-BM-092: Behavioural Biology</b> Behavioural Biology			
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<ul style="list-style-type: none"> <li>• 1 ECTS, Method of grading: numerical grade</li> <li>• written examination (approx. 30 minutes, word problems and/or multiple choice questions)</li> </ul>
<b>Allocation of places</b>
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<b>Additional information</b>
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<b>Workload</b>
--
<b>Teaching cycle</b>
--
<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)
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<b>Module appears in</b>
Bachelor' degree (1 major) Biomedicine (2009)

## Modules Chemistry

(12 ECTS credits)

Module title			Abbreviation
General chemistry for students of biomedicine			o8-CH-BM-102-mo1
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. <ul style="list-style-type: none"><li>o8-AC-NF-1-102: V (no information on SWS (weekly contact hours) and course language available)</li><li>o8-IOC-1-102: V (no information on SWS (weekly contact hours) and course language available)</li><li>o8-CH-BMP-1-102: P (no information on SWS (weekly contact hours) and course language available)</li></ul>			
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)			
Assessment in this module comprises the assessments in the individual module components as specified below. Unless stated otherwise, successful completion of the module will require successful completion of all individual assessments.			
<b>Assessment in module component o8-AC-NF-1-102:</b> Introduction to Inorganic Chemistry for Students of Biology, Medicine and Dentistry <ul style="list-style-type: none"><li>3 ECTS, Method of grading: numerical grade</li><li>written examination (approx. 60 minutes)</li></ul>			
<b>Assessment in module component o8-IOC-1-102:</b> Organic Chemistry for students of medicine, biomedicine, dental medicine, engineering and natural science <ul style="list-style-type: none"><li>3 ECTS, Method of grading: numerical grade</li><li>written examination (approx. 60 minutes)</li></ul>			
<b>Assessment in module component o8-CH-BMP-1-102:</b> Practical chemistry course for students of biomedicine <ul style="list-style-type: none"><li>2 ECTS, Method of grading: (not) successfully completed</li><li>pre/post-experiment examination talks (Vor-/Nachtestate, approx. 15 minutes each), log (approx. 2 to 5 pages)</li><li>Assessment offered: once a year, summer semester</li><li>Only after successful completion of module components: Successful completion of module component o8-AC-NF-1 or o8-IOC-1 is a prerequisite for participation in module component o8-CH-BMP-1.</li></ul>			
Allocation of places			
Information on the allocation of places will be listed separately for each module component. <ul style="list-style-type: none"><li>o8-CH-BMP-1-102: --</li><li>o8-AC-NF-1-102: Only as part of pool of general key skills (ASQ): 15 places. Places will be allocated by lot.</li><li>o8-IOC-1-102: Only as part of pool of general key skills (ASQ): 15 places. Places will be allocated by lot.</li></ul>			
Additional information			
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<b>Workload</b>
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<b>Teaching cycle</b>
--
<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)
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<b>Module appears in</b>
Bachelor' degree (1 major) Biomedicine (2009)
Bachelor' degree (1 major) Biomedicine (2013)



Module title		Abbreviation
Organic Chemistry 2 for students of biomedicine		o8-OC-BM-102-m01
Module coordinator		Module offered by
lecturer of lecture "Organische Chemie für Studierende der Medizin, Biomedizin, Zahnmedizin, Ingenieur- und 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	--
<b>Contents</b>		
This module deals with the fundamental principles of organic chemistry.		
<b>Intended learning outcomes</b>		
Students have developed a knowledge of the fundamental principles of organic chemistry and are able to apply that knowledge to research problems.		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
V (no information on SWS (weekly contact hours) and course language available)		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
a) 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)		
<b>Allocation of places</b>		
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<b>Additional information</b>		
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<b>Workload</b>		
--		
<b>Teaching cycle</b>		
--		
<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
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<b>Module appears in</b>		
Bachelor' degree (1 major) Biomedicine (2009)		
Bachelor' degree (1 major) Biomedicine (2013)		

## Modules Physics

(10 ECTS credits)

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

Module title		Abbreviation
Practical Course Physics for Students of Non-physics-related Minor Subjects		11-PFNF-072-m01
Module coordinator		Module offered by
Managing Director of the Institute of Applied Physics		Faculty of Physics and Astronomy
ECTS	Method of grading	Only after succ. compl. of module(s)
3	(not) successfully completed	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	--
Contents		
Mechanics, vibration theory, thermodynamics, optics, X-rays, nuclear magnetic resonance, Atomic and Nuclear Physics.		
Intended learning outcomes		
The students have knowledge of the principles of Physics.		
Courses (type, number of weekly contact hours, language — if other than German)		
P (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
a) oral test (approx. 15 minutes) during experiment and b) ungraded written examination (approx. 90 minutes)		
Allocation of places		
Only as part of pool of general key skills (ASQ): 10 places. Places will be allocated by lot.		
Additional information		
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Workload		
--		
Teaching cycle		
--		
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)		
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Bachelor' degree (1 major) Biomedicine (2009)  
Bachelor' degree (1 major) Biomedicine (2013)  
Bachelor' degree (1 major) FOKUS Chemistry (2011)

## **Modules Mathematics/Statistics**

(5 ECTS credits)

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 evaluation 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 is creditable for 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)		



## **Modules Biochemistry**

(21 ECTS credits)

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 is creditable for 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.
<b>Contents</b>		
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.		
<b>Intended learning outcomes</b>		
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.		
<b>Courses</b> (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)		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
a) written examination (approx. 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)		
<b>Allocation of places</b>		
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<b>Additional information</b>		
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<b>Workload</b>		
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<b>Teaching cycle</b>		
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<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
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<b>Module appears in</b>		
Bachelor' degree (1 major) Biomedicine (2009)		
Bachelor' degree (1 major) Biomedicine (2013)		

## **Modules Anatomy**

(10 ECTS credits)

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. <ul style="list-style-type: none"><li>03-98-ANA-1-092: S + Ü (no information on SWS (weekly contact hours) and course language available)</li><li>03-98-ANA-2-092: S + V + P (no information on SWS (weekly contact hours) and course language available)</li></ul>			
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)			
Assessment in this module comprises the assessments in the individual module components as specified below. Unless stated otherwise, successful completion of the module will require successful completion of all individual assessments.			
Assessment in module component 03-98-ANA-1-092: Anatomy and Cell Biology Anatomy and Cell Biology <ul style="list-style-type: none"><li>5 ECTS, Method of grading: numerical grade</li><li>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)</li><li>Assessment offered: once a year, winter semester</li><li>Other prerequisites: Admission prerequisite to assessment: regular attendance of courses (lectures excluded) as specified at the beginning of the course.</li></ul>			
Assessment in module component 03-98-ANA-2-092: Histology Histology Histology <ul style="list-style-type: none"><li>5 ECTS, Method of grading: numerical grade</li><li>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)</li><li>Assessment offered: once a year, summer semester</li><li>Other prerequisites: Admission prerequisite to assessment: regular attendance of courses (lectures excluded) as specified at the beginning of the course.</li></ul>			
Allocation of places			
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Additional information			
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Bachelor's with 1 major Biomedicine (2009)		JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Biomedizin - 2009	page 30 / 93

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

## **Modules Physiology**

(10 ECTS credits)



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.
<b>Contents</b>		
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.		
<b>Intended learning outcomes</b>		
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.		
<b>Courses</b> (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)		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
2 written examinations (approx. 60 minutes each)		
<b>Allocation of places</b>		
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<b>Additional information</b>		
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<b>Workload</b>		
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<b>Teaching cycle</b>		
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<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
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<b>Module appears in</b>		
Bachelor' degree (1 major) Biomedicine (2009)		
Bachelor' degree (1 major) Biomedicine (2013)		

## **Modules Pharmacology and Toxicology**

(7 ECTS credits)

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 is creditable for 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)		

## **Modules Microbiology, Virology and Immunology**

(5 ECTS credits)

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 is creditable for 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)		

## **Modules Pathology**

(3 ECTS credits)

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 is creditable for 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)		

## **Modules Advanced Lab Course**

(10 ECTS credits)



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.
<b>Contents</b>		
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.		
<b>Intended learning outcomes</b>		
Performing more complex experiments with sequential methods. Students gain an insight into new areas of research based on current literature and knowledge transfer.		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
R (no information on SWS (weekly contact hours) and course language available)		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
log (10 to 15 pages) and presentation (approx. 15 minutes)		
<b>Allocation of places</b>		
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<b>Additional information</b>		
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<b>Workload</b>		
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<b>Teaching cycle</b>		
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<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
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<b>Module appears in</b>		
Bachelor' degree (1 major) Biomedicine (2009)		
Bachelor' degree (1 major) Biomedicine (2013)		

# Thesis

(12 ECTS credits)

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	--
<b>Contents</b>		
Conduct a defined and focused research project under supervision within a limited time frame.		
<b>Intended learning outcomes</b>		
Students demonstrate their ability to solve a defined problem within a chosen area within a given time frame by applying scientific research methods.		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
This module has 2 components; information on courses listed separately for each component. <ul style="list-style-type: none"> <li>03-98-THK-2-092: K (no information on language and number of weekly contact hours available)</li> <li>03-98-THK-1-092: A (no information on language and number of weekly contact hours available)</li> </ul>		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
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..		
<b>Assessment component to module component 03-98-THK-2-092:</b> Kolloquium <ul style="list-style-type: none"> <li>2 ECTS credits, method of grading: numerical grade</li> <li>oral examination of on candidate each (approx. 20 minutes)</li> </ul>		
<b>Assessment component to module component 03-98-THK-1-092:</b> Bachelorthesis Biomedizin <ul style="list-style-type: none"> <li>10 ECTS credits, method of grading: numerical grade</li> <li>written thesis (20-40 pages)</li> </ul>		
<b>Allocation of places</b>		
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<b>Additional information</b>		
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<b>Workload</b>		
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<b>Teaching cycle</b>		
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<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
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<b>Module appears in</b>		
Bachelor' degree (1 major) Biomedicine (2009)		

## Compulsory Electives

(35 ECTS credits)

## Compulsory Electives I

(5 ECTS credits)

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 is creditable for 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 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 is creditable for 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)		

## Compulsory Electives II

(5 ECTS credits)



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 is creditable for 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 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 is creditable for 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
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 is creditable for 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
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	--
<b>Contents</b>		
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.		
<b>Intended learning outcomes</b>		
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.		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
V + S (no information on SWS (weekly contact hours) and course language available)		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
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)		
<b>Allocation of places</b>		
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<b>Additional information</b>		
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<b>Workload</b>		
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<b>Teaching cycle</b>		
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<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
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<b>Module appears in</b>		
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.
<b>Contents</b>		
General fundamentals of neuroanatomy, important methods in neurobiology, diseases of the nervous system: symptoms, diagnosis, therapeutic options, discussion of novel research results.		
<b>Intended learning outcomes</b>		
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.		
<b>Courses</b> (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)		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
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)		
<b>Allocation of places</b>		
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<b>Additional information</b>		
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<b>Workload</b>		
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<b>Teaching cycle</b>		
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<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
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<b>Module appears in</b>		
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)		

## Compulsory Electives III

(10 ECTS credits)

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.
<b>Contents</b>		
How antigen recognition, uptake and presentation by dendritic cells lead to induction of activation markers, transcription factors, cytokines and proliferation of CD4+ T lymphocytes.		
<b>Intended learning outcomes</b>		
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.		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
P + S (no information on SWS (weekly contact hours) and course language available)		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
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)		
<b>Allocation of places</b>		
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<b>Additional information</b>		
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<b>Workload</b>		
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<b>Teaching cycle</b>		
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<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
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<b>Module appears in</b>		
Bachelor' degree (1 major) Biomedicine (2009)		

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.
<b>Contents</b>		
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.		
<b>Intended learning outcomes</b>		
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 anti-infectives. 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 in 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.		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
P + S (no information on SWS (weekly contact hours) and course language available)		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
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)		
<b>Allocation of places</b>		
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<b>Additional information</b>		
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<b>Workload</b>		
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<b>Teaching cycle</b>		
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<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
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<b>Module appears in</b>		
Bachelor' degree (1 major) Biomedicine (2009)		
Bachelor' degree (1 major) Biomedicine (2013)		



Module title		Abbreviation
<b>Pathophysiology and pathobiochemistry with clinical demonstrations for students of biomedicine</b>		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.
<b>Contents</b>		
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.		
<b>Intended learning outcomes</b>		
Students gain an understanding of how knowledge of pathobiochemical and pathophysiological disease processes translates into clinical diagnosis and treatment.		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
V + V (no information on SWS (weekly contact hours) and course language available)		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
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)		
<b>Allocation of places</b>		
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<b>Additional information</b>		
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<b>Workload</b>		
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<b>Teaching cycle</b>		
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<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
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<b>Module appears in</b>		
Bachelor' degree (1 major) Biomedicine (2009)		
Bachelor' degree (1 major) Biomedicine (2013)		

## Compulsory Electives IV

(15 ECTS credits)

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 is creditable for 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 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 is creditable for 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
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 is creditable for 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
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 is creditable for 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.
<b>Contents</b>		
General fundamentals of neuroanatomy, important methods in neurobiology, diseases of the nervous system: symptoms, diagnosis, therapeutic options, discussion of novel research results.		
<b>Intended learning outcomes</b>		
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.		
<b>Courses</b> (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)		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
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)		
<b>Allocation of places</b>		
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<b>Additional information</b>		
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<b>Workload</b>		
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<b>Teaching cycle</b>		
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<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
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<b>Module appears in</b>		
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
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 is creditable for 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
<b>Bacterial genetics - Infectiology</b>		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 is creditable for 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)		

<b>Module title</b>		<b>Abbreviation</b>
<b>Parasitology</b>		03-98-PMP-092-m01
<b>Module coordinator</b>		<b>Module offered by</b>
holder of the Professorship of Medicinical Parasitology and holder of the Professorship of Zoology I		Faculty of Medicine
<b>ECTS</b>	<b>Method of grading</b>	<b>Only after succ. compl. of module(s)</b>
5	numerical grade	--
<b>Duration</b>	<b>Module level</b>	<b>Other prerequisites</b>
1 semester	undergraduate	Admission prerequisite to assessment: regular attendance of courses (lectures excluded) as specified at the beginning of the course.
<b>Contents</b>		
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 anthelmintics. 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.		
<b>Intended learning outcomes</b>		
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.		
<b>Courses</b> (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)		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
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)		
<b>Allocation of places</b>		
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<b>Additional information</b>		
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<b>Workload</b>		
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<b>Teaching cycle</b>		
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<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
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<b>Module appears in</b>		
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 is creditable for 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 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 is creditable for 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)		

## Subject-specific Key Skills

(15 ECTS credits)

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	--
<b>Contents</b>		
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.		
<b>Intended learning outcomes</b>		
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).		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
This module comprises 2 module components. Information on courses will be listed separately for each module component. <ul style="list-style-type: none"> <li>03-98-FSQ-GEN-1-092: V (no information on SWS (weekly contact hours) and course language available)</li> <li>03-98-FSQ-Tier-1-092: V + P (no information on SWS (weekly contact hours) and course language available)</li> </ul>		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
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.		
<b>Assessment in module component 03-98-FSQ-GEN-1-092:</b> Genetic Engineering and Biosafety <ul style="list-style-type: none"> <li>1 ECTS, Method of grading: (not) successfully completed</li> <li>written examination (approx. 15 minutes)</li> </ul> <b>Assessment in module component 03-98-FSQ-Tier-1-092:</b> Laboratory animal sciences Laboratory animal sciences <ul style="list-style-type: none"> <li>2 ECTS, Method of grading: (not) successfully completed</li> <li>written examination (approx. 30 to 60 minutes)</li> </ul>		
<b>Allocation of places</b>		
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<b>Additional information</b>		
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<b>Workload</b>		
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<b>Teaching cycle</b>		
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<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
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<b>Module appears in</b>		

Bachelor' degree (1 major) Biomedicine (2009)

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.
<b>Contents</b>		
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.		
<b>Intended learning outcomes</b>		
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.		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
This module comprises 2 module components. Information on courses will be listed separately for each module component. <ul style="list-style-type: none"> <li>03-98-FSQ-EXP-1-092: V (no information on SWS (weekly contact hours) and course language available)</li> <li>03-98-FSQ-ETH-1-092: V (no information on SWS (weekly contact hours) and course language available)</li> </ul>		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
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.		
<b>Assessment in module component 03-98-FSQ-EXP-1-092:</b> From experiment to publication - how science works <ul style="list-style-type: none"> <li>1 ECTS, Method of grading: (not) successfully completed</li> <li>preparation of educational materials and materials for demonstrations (approx. 10 pages)</li> <li>Other prerequisites: Admission prerequisite to assessment: regular attendance as specified at the beginning of the course.</li> </ul> <b>Assessment in module component 03-98-FSQ-ETH-1-092:</b> Ethics in Science <ul style="list-style-type: none"> <li>1 ECTS, Method of grading: (not) successfully completed</li> <li>preparation of educational materials and materials for demonstrations (approx. 10 pages)</li> <li>Other prerequisites: Admission prerequisite to assessment: regular attendance as specified at the beginning of the course.</li> </ul>		
<b>Allocation of places</b>		
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<b>Additional information</b>		
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<b>Workload</b>		
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<b>Teaching cycle</b>		
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<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
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Bachelor's with 1 major Biomedicine (2009)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Biomedizin - 2009	page 72 / 93



<b>Module appears in</b>
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 <i>Strahlenschutzverordnung</i> (Radiation Protection Ordinance, StrlSchV).		
Intended learning outcomes		
Acquisition of formal expertise for handling open and sealed radioactive substances in accordance with the <i>Strahlenschutzverordnung</i> (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 is creditable for 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
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 is creditable for 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 is creditable for 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 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 is creditable for 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 is creditable for 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
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 is creditable for 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 is creditable for 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 is creditable for 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
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.
<b>Contents</b>		
Students present selected recent publications and discuss their contents, methods and results within the group.		
<b>Intended learning outcomes</b>		
Students acquire the ability to critically read scientific literature, draw their own conclusions and to evaluate the results.		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
S (no information on SWS (weekly contact hours) and course language available)		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
presentation (approx. 15 minutes)		
<b>Allocation of places</b>		
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<b>Additional information</b>		
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<b>Workload</b>		
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<b>Teaching cycle</b>		
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<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
--		
<b>Module appears in</b>		
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	--
<b>Contents</b>		
Students present selected recent publications and discuss their contents, methods and results within the group.		
<b>Intended learning outcomes</b>		
Students acquire the ability to critically read scientific literature, draw their own conclusions and to evaluate the results.		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
S (no information on SWS (weekly contact hours) and course language available)		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
2 presentations (approx. 15 minutes each)		
<b>Allocation of places</b>		
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<b>Additional information</b>		
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<b>Workload</b>		
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<b>Teaching cycle</b>		
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<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
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<b>Module appears in</b>		
Bachelor' degree (1 major) Biomedicine (2009)		

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 is creditable for bonus)		
preparation of educational materials and materials for demonstrations (approx. 10 pages)		
Allocation of places		
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Additional information		
--		
Workload		
--		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) 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.
<b>Contents</b>		
Field trip to selected institutions or companies that are relevant to the life sciences.		
<b>Intended learning outcomes</b>		
Students make contact with industry and other potential employers.		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
E (no information on SWS (weekly contact hours) and course language available)		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
report (1 to 2 pages)		
<b>Allocation of places</b>		
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<b>Additional information</b>		
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<b>Workload</b>		
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<b>Teaching cycle</b>		
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<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
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<b>Module appears in</b>		
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.
<b>Contents</b>		
Students spend 2 weeks at a laboratory and participate in routine work.		
<b>Intended learning outcomes</b>		
Students gain first insights into routine lab work and acquire new practical skills.		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
P (no information on SWS (weekly contact hours) and course language available)		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
log (5 to 10 pages)		
<b>Allocation of places</b>		
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<b>Additional information</b>		
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<b>Workload</b>		
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<b>Teaching cycle</b>		
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<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
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<b>Module appears in</b>		
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.
<b>Contents</b>		
Students spend 2 weeks working on a small, well-defined scientific lab project.		
<b>Intended learning outcomes</b>		
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.		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
P (no information on SWS (weekly contact hours) and course language available)		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
log (5 to 10 pages)		
<b>Allocation of places</b>		
--		
<b>Additional information</b>		
--		
<b>Workload</b>		
--		
<b>Teaching cycle</b>		
--		
<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
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<b>Module appears in</b>		
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	--
<b>Contents</b>		
Students spend 3 weeks working on a small, well-defined scientific lab project.		
<b>Intended learning outcomes</b>		
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.		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
P (no information on SWS (weekly contact hours) and course language available)		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
log (10 to 15 pages) and talk (approx. 10 minutes)		
<b>Allocation of places</b>		
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<b>Additional information</b>		
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<b>Workload</b>		
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<b>Teaching cycle</b>		
--		
<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
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<b>Module appears in</b>		
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.
<b>Contents</b>		
Students spend 4 weeks working on a small, well-defined scientific lab project.		
<b>Intended learning outcomes</b>		
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.		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
P (no information on SWS (weekly contact hours) and course language available)		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
log (10 to 15 pages) and talk (approx. 10 minutes)		
<b>Allocation of places</b>		
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<b>Additional information</b>		
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<b>Workload</b>		
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<b>Teaching cycle</b>		
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<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
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<b>Module appears in</b>		
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 is creditable for 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
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 is creditable for 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
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. <ul style="list-style-type: none"> <li>03-98-FSQ-NETW-1-092: S (no information on SWS (weekly contact hours) and course language available)</li> <li>03-98-FSQ-BEW-1-092: S (no information on SWS (weekly contact hours) and course language available)</li> </ul>		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
Assessment in this module comprises the assessments in the individual module components as specified below. Unless stated otherwise, successful completion of the module will require successful completion of all individual assessments.		
<b>Assessment in module component 03-98-FSQ-NETW-1-092:</b> Personal skills and scientific networking <ul style="list-style-type: none"> <li>2 ECTS, Method of grading: (not) successfully completed</li> <li>term paper (5 to 10 pages) or preparation of educational materials and materials for demonstrations (approx. 10 pages)</li> <li>Other prerequisites: Admission prerequisite to assessment: regular attendance of courses (lectures excluded) as specified at the beginning of the course.</li> </ul> <b>Assessment in module component 03-98-FSQ-BEW-1-092:</b> Job Application in the Life Sciences <ul style="list-style-type: none"> <li>1 ECTS, Method of grading: (not) successfully completed</li> <li></li> <li>Other prerequisites: Admission prerequisite to assessment: regular attendance of courses (lectures excluded) as specified at the beginning of the course.</li> </ul>		
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)