Julius-Maximilians-
UNIVERSITÄT
WÜRZBURG

Subdivided Module Catalogue

for the Subject

Biology

as a Master's with 1 major

with the degree "Master of Science"

(120 ECTS credits)

Examination regulations version: 2011
Responsible: Faculty of Biology

Course of Studies - Contents and Objectives

The study program requires the intensive theoretical and practical training in scientific topics in Biology and Life Sciences. The graduate is able to use appropriate methods to answer scientific questions and to conduct research projects.

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)):

21-Sep-2011 (2011-81)

This module handbook seeks to render, as accurately as possible, the data that is of statutory relevance according to the examination regulations of the degree subject. However, only the FSB (subject-specific provisions) and SFB (list of modules) in their officially published versions shall be legally binding. In the case of doubt, the provisions on, in particular, module assessments specified in the FSB/SFB shall prevail.

The subject is divided into

Abbreviation	Module title	ECTS credits	Method of grading	page
Thesis (30 ECTS credits)				
07-MT-102-m01	Final Examination in Biology	30	NUM	135
Compulsory Electives (90 ECTS credits)				
Compulsory Electives 1 (75 ECTS credits)				
Focus 1				
Neurosciences (30 ECTS credits)				
07-MS1-102-m01	Neurobiology, Behavior and Animal Ecology (Lecture)	10	NUM	54
07-MS1N-102-m01	Molecular and Clinical Neurobiology (Lecture and Seminar)	10	NUM	59
07-MS1NF1-102-m01	Neurobiology (Practical Course and Seminar 1)	10	NUM	62
07-MS1NF2-102-m01	Neurobiology (Practical Course and Seminar 2)	15	B/NB	63
07-MS1NB-112-m01	Neurogenetics of Behavior	10	NUM	60
07-MS1NEC-112-m01	Developmental Neurobiology and Chronobiology	10	NUM	61
07-MS1CB-141-m01	Endogenous Clocks	10	NUM	56
07-MS1NMND-141-m01	Neuromodulation and Neuronal Development	10	NUM	64
Animal Ecology and Tropical Biology (30 ECTS credits)				
07-MS1TÖ2-111-m01	Animal Ecology and Tropical Biology 2	10	NUM	66
07-MS1-102-m01	Neurobiology, Behavior and Animal Ecology (Lecture)	10	NUM	54
07-MS1TÖ-102-m01	Animal Ecology and Tropical Biology (Lecture and Seminar)	10	NUM	65
07-MS1TÖF1-102-m01	Animal Ecology F1 (Practical Course and Seminar 1)	10	NUM	67
07-MS1TÖF2-102-m01	Animal Ecology and Tropical Biology F2 (Practical Course and Seminar 2)	15	B/NB	69
Behavioral Physiology and Sociobiology (30 ECTS credits)				
07-MS1ES-111-m01	Experimental Sociobiology	10	NUM	57
07-MS1-102-m01	Neurobiology, Behavior and Animal Ecology (Lecture)	10	NUM	54
07-MS1K-102-m01	Communication Biology (Lecture)	10	NUM	58
07-MS1VF1-102-m01	Behavioral Biology (Practical Course and Seminar 1)	10	NUM	70
07-MS1VF2-102-m01	Behavioral Biology (Practical Course and Seminar 2)	15	B/NB	71
07-MS1NB-112-m01	Neurogenetics of Behavior	10	NUM	60
Focus 2				
Molecular Cell- and Developmental Biology (30 ECTS credits)				
07-MS2-102-m01	Molecular Biology (Lecture)	10	NUM	72
07-MS2ZE1-102-m01	Cell- and Developmental Biology Master 1 (Lecture and Seminar 1)	10	NUM	98
07-MS2ZE2-102-m01	Cell- and Developmental Biology Master 2 (Lecture and Seminar 2)	10	NUM	99
07-MS2ZEF1-102-m01	Cell- and Developmental Biology Practical Course and Seminar 1	10	NUM	100
07-MS2ZEF2-102-m01	Cell- and Developmental Biology Practical Course and Seminar 2	15	B/NB	101
Microbiology (30 ECTS credits)				
07-MS2-102-m01	Molecular Biology (Lecture)	10	NUM	72
07-MS2MF1-102-m01	Microbiology (Practical Course and Seminar 1)	10	NUM	91

07-MS2MF2-102-m01	Microbiology (Practical Course and Seminar 2)	15	B/NB	92
07-MS2M1-112-m01	Microbiology 1 (Lecture and Seminar)	10	NUM	89
07-MS2M2-112-m01	Microbiology 2 (Lecture and Seminar)	10	NUM	90
Cellular and Molecular Biotechnology (30 ECTS credits)				
07-MS2-102-m01	Molecular Biology (Lecture)	10	NUM	72
07-MS2BT-102-m01	Biophysics and Molecular Biotechnology (Lecture and Seminar)	10	NUM	79
07-MS2BTF1-102-m01	Biophysics and Molecular Biotechnology (Practical Course and Seminar 1)	10	NUM	80
07-MS2BTF2-102-m01	Biophysics and Molecular Biotechnology (Practical Course and Seminar 2)	15	B/NB	81
07-MS2BI-102-m01	Bioinformatics (Lecture and Seminar)	10	NUM	76
07-MS3BB-102-m01	Biophysics and Biochemistry	10	NUM	109
Bioinformatics (30 ECTS credits)				
07-MS1-102-m01	Neurobiology, Behavior and Animal Ecology (Lecture)	10	NUM	54
07-MS1N-102-m01	Molecular and Clinical Neurobiology (Lecture and Seminar)	10	NUM	59
07-MS1TÖ-102-m01	Animal Ecology and Tropical Biology (Lecture and Seminar)	10	NUM	65
07-MS1K-102-m01	Communication Biology (Lecture)	10	NUM	58
07-MS2-102-m01	Molecular Biology (Lecture)	10	NUM	72
07-MS2ZE1-102-m01	Cell- and Developmental Biology Master 1 (Lecture and Seminar 1)	10	NUM	98
07-MS2ZE2-102-m01	Cell- and Developmental Biology Master 2 (Lecture and Seminar 2)	10	NUM	99
07-MS2BI-102-m01	Bioinformatics (Lecture and Seminar)	10	NUM	76
07-MS2IM1-102-m01	Immunology 1 (Lecture and Seminar)	10	NUM	85
07-MS2IM2-102-m01	Immunology 2 (Lecture and Seminar)	10	NUM	86
07-MS2V1-102-m01	Virology 1 (Lecture and Seminar)	10	NUM	94
07-MS2V2-102-m01	Virology 2 (Lecture and Seminar)	10	NUM	95
07-MS2HG-102-m01	Human Genetics (Lecture and Seminar)	10	NUM	82
07-MS3PA-102-m01	Developmental Physiology and Adaption of Plants (Lecture and Seminar)	10	NUM	116
07-MS3BB-102-m01	Biophysics and Biochemistry	10	NUM	109
07-MS3BA-102-m01	Response towards Biotic and Abiotic Factors	10	NUM	108
07-MS3S-102-m01	System Biology (Lecture and Seminar)	10	NUM	122
07-MS2BIF1-102-m01	Bioinformatics (Practical Course and Seminar 1)	10	NUM	77
07-MS2BIF2-102-m01	Bioinformatics (Practical Course and Seminar 2)	15	B/NB	78
07-MS2M1-112-m01	Microbiology 1 (Lecture and Seminar)	10	NUM	89
07-MS3-112-m01	Current Methods in Plant Biology (Lecture)	10	NUM	104
07-MS2M2-112-m01	Microbiology 2 (Lecture and Seminar)	10	NUM	90
Immunology (30 ECTS credits)				
07-MS2IM1-102-m01	Immunology 1 (Lecture and Seminar)	10	NUM	85
07-MS2IM2-102-m01	Immunology 2 (Lecture and Seminar)	10	NUM	86
07-MS2IMF1-102-m01	Immunology (Practical Course and Seminar 1)	10	NUM	87
07-MS2IMF2-102-m01	Immunology (Practical Course and Seminar 2)	15	B/NB	88
Virology (30 ECTS credits)				
07-MS2V1-102-m01	Virology 1 (Lecture and Seminar)	10	NUM	94

07-MS2V2-102-m01	Virology 2 (Lecture and Seminar)	10	NUM	95
07-MS2VF1-102-m01	Virology (Practical Course and Seminar 1)	10	NUM	96
07-MS2VF2-102-m01	Virology (Practical Course and Seminar 2)	15	B/NB	97
Human Genetics (30 ECTS credits)				
07-MS2-102-m01	Molecular Biology (Lecture)	10	NUM	72
07-MS2ZE1-102-m01	Cell- and Developmental Biology Master 1 (Lecture and Seminar 1)	10	NUM	98
07-MS2ZE2-102-m01	Cell- and Developmental Biology Master 2 (Lecture and Seminar 2)	10	NUM	99
07-MS2IM1-102-m01	Immunology 1 (Lecture and Seminar)	10	NUM	85
07-MS2IM2-102-m01	Immunology 2 (Lecture and Seminar)	10	NUM	86
07-MS2V1-102-m01	Virology 1 (Lecture and Seminar)	10	NUM	94
07-MS2V2-102-m01	Virology 2 (Lecture and Seminar)	10	NUM	95
07-MS2HG-102-m01	Human Genetics (Lecture and Seminar)	10	NUM	82
07-MS2HGF1-102-m01	Human Genetics (Practical Course and Seminar 1)	10	NUM	83
07-MS2HGF2-102-m01	Human Genetics (Practical Course and Seminar 2)	15	B/NB	84
07-MS2M1-112-m01	Microbiology 1 (Lecture and Seminar)	10	NUM	89
07-MS2M2-112-m01	Microbiology 2 (Lecture and Seminar)	10	NUM	90
Physiological Chemistry (30 ECTS credits)				
07-MS2-102-m01	Molecular Biology (Lecture)	10	NUM	72
07-MS2ZE1-102-m01	Cell- and Developmental Biology Master 1 (Lecture and Seminar 1)	10	NUM	98
07-MS2ZE2-102-m01	Cell- and Developmental Biology Master 2 (Lecture and Seminar 2)	10	NUM	99
07-MS2ZEF1-102-m01	Cell- and Developmental Biology Practical Course and Seminar 1	10	NUM	100
07-MS2PHF2-102-m01	Physiological Chemistry (Practical Course and Seminar 2)	15	B/NB	93
07-MSL2-102-m01	Laboratory practical course 2	10	B/NB	133
Cellular Tumorbiology (30 ECTS credits)				
07-MS2-102-m01	Molecular Biology (Lecture)	10	NUM	72
07-MS2ZE1-102-m01	Cell- and Developmental Biology Master 1 (Lecture and Seminar 1)	10	NUM	98
07-MS2ZE2-102-m01	Cell- and Developmental Biology Master 2 (Lecture and Seminar 2)	10	NUM	99
07-MS2IM1-102-m01	Immunology 1 (Lecture and Seminar)	10	NUM	85
07-MS2IM2-102-m01	Immunology 2 (Lecture and Seminar)	10	NUM	86
07-MS2V1-102-m01	Virology 1 (Lecture and Seminar)	10	NUM	94
07-MS2V2-102-m01	Virology 2 (Lecture and Seminar)	10	NUM	95
07-MS2HG-102-m01	Human Genetics (Lecture and Seminar)	10	NUM	82
07-MSL2-102-m01	Laboratory practical course 2	10	B/NB	133
07-MS2M1-112-m01	Microbiology 1 (Lecture and Seminar)	10	NUM	89
07-MS2M2-112-m01	Microbiology 2 (Lecture and Seminar)	10	NUM	90
07-MS2ZTF1-112-m01	Cellular Tumorbiology Master 1 (Practical Course and Seminar 1)	10	NUM	102
07-MS2ZTF2-112-m01	Cellular Tumorbiology Master 2 (Practical Course and Seminar 2)	15	B/NB	103

Focus 3				
Molecular Cell- and Developmental Biology of Plants (30 ECTS credits)				
07-MS3PA-102-m01	Developmental Physiology and Adaption of Plants (Lecture and Seminar)	10	NUM	116
07-MS3BB-102-m01	Biophysics and Biochemistry	10	NUM	109
07-MS3BA-102-m01	Response towards Biotic and Abiotic Factors	10	NUM	108
07-MS3MF1-102-m01	Molecular Biology of Plants (Practical Course and Seminar 1)	10	NUM	115
07-MS3ZE-102-m01	Specific Molecular-, Cell- and Developmental Biology of Plants (Practical Course and Seminar 1)	15	B/NB	125
07-MS3-112-m01	Current Methods in Plant Biology (Lecture)	10	NUM	104
Biochemistry and Structural Biology (30 ECTS credits)				
07-MS3PA-102-m01	Developmental Physiology and Adaption of Plants (Lecture and Seminar)	10	NUM	116
07-MS3BB-102-m01	Biophysics and Biochemistry	10	NUM	109
07-MS3BA-102-m01	Response towards Biotic and Abiotic Factors	10	NUM	108
07-MS3BSF1-102-m01	Biochemistry and Structural Biology (Practical Course and Seminar 1)	10	NUM	111
07-MS3BSF2-102-m01	Biochemistry and Structural Biology (Practical Course and Seminar 2)	15	B/NB	112
07-MS3-112-m01	Current Methods in Plant Biology (Lecture)	10	NUM	104
Biophysics (30 ECTS credits)				
07-MS3PA-102-m01	Developmental Physiology and Adaption of Plants (Lecture and Seminar)	10	NUM	116
07-MS3BB-102-m01	Biophysics and Biochemistry	10	NUM	109
07-MS3BA-102-m01	Response towards Biotic and Abiotic Factors	10	NUM	108
07-MS3ZE-102-m01	Specific Molecular-, Cell- and Developmental Biology of Plants (Practical Course and Seminar 1)	15	B/NB	125
07-MS3BPF1-102-m01	Biophysics of Membraneproteins of Plants (Practical Course and Seminar 1)	10	NUM	110
07-MS3-112-m01	Current Methods in Plant Biology (Lecture)	10	NUM	104
Pharmaceutical Biology (30 ECTS credits)				
07-MS3PA-102-m01	Developmental Physiology and Adaption of Plants (Lecture and Seminar)	10	NUM	116
07-MS3BB-102-m01	Biophysics and Biochemistry	10	NUM	109
07-MS3BA-102-m01	Response towards Biotic and Abiotic Factors	10	NUM	108
07-MS3PBF1-102-m01	Pharmaceutical Biology (Practical Course and Seminar 1)	10	NUM	117
07-MS3PBF2-102-m01	Pharmaceutical Biology (Practical Course and Seminar 2)	15	B/NB	119
07-MS3-112-m01	Current Methods in Plant Biology (Lecture)	10	NUM	104
Ecology and Ecophysiology of Plants (30 ECTS credits)				
07-MS3PA-102-m01	Developmental Physiology and Adaption of Plants (Lecture and Seminar)	10	NUM	116
07-MS3BB-102-m01	Biophysics and Biochemistry	10	NUM	109
07-MS3BA-102-m01	Response towards Biotic and Abiotic Factors	10	NUM	108
07-MS3PÖF1-102-m01	Specific Ecology and Ecophysiology of Plants (Practical Course and Seminar 1)	10	NUM	120

07-MS3PÖF2-102-m01	Specific Ecology and Ecophysiology of Plants (Practical Course and Seminar 2)	15	B/NB	121
07-MS3-112-m01	Current Methods in Plant Biology (Lecture)	10	NUM	104
Microbial and Chemical Ecology (30 ECTS credits)				
07-MS3PA-102-m01	Developmental Physiology and Adaption of Plants (Lecture and Seminar)	10	NUM	116
07-MS3BB-102-m01	Biophysics and Biochemistry	10	NUM	109
07-MS3BA-102-m01	Response towards Biotic and Abiotic Factors	10	NUM	108
07-MS3MCÖ-F1-102-m01	Microbial and Chemical Ecology (Practical Course and Seminar 1)	10	NUM	113
07-MS3MCÖ-F2-102-m01	Microbial and Chemical Ecology (Practical Course and Seminar 2)	15	B/NB	114
07-MS3-112-m01	Current Methods in Plant Biology (Lecture)	10	NUM	104
System Biology (30 ECTS credits)				
07-MS1-102-m01	Neurobiology, Behavior and Animal Ecology (Lecture)	10	NUM	54
07-MS1N-102-m01	Molecular and Clinical Neurobiology (Lecture and Seminar)	10	NUM	59
07-MS1TÖ-102-m01	Animal Ecology and Tropical Biology (Lecture and Seminar)	10	NUM	65
07-MS1K-102-m01	Communication Biology (Lecture)	10	NUM	58
07-MS2-102-m01	Molecular Biology (Lecture)	10	NUM	72
07-MS2ZE1-102-m01	Cell- and Developmental Biology Master 1 (Lecture and Seminar 1)	10	NUM	98
07-MS2ZE2-102-m01	Cell- and Developmental Biology Master 2 (Lecture and Seminar 2)	10	NUM	99
07-MS2BI-102-m01	Bioinformatics (Lecture and Seminar)	10	NUM	76
07-MS2IM1-102-m01	Immunology 1 (Lecture and Seminar)	10	NUM	85
07-MS2IM2-102-m01	Immunology 2 (Lecture and Seminar)	10	NUM	86
07-MS2V1-102-m01	Virology 1 (Lecture and Seminar)	10	NUM	94
07-MS2V2-102-m01	Virology 2 (Lecture and Seminar)	10	NUM	95
07-MS2HG-102-m01	Human Genetics (Lecture and Seminar)	10	NUM	82
07-MS3PA-102-m01	Developmental Physiology and Adaption of Plants (Lecture and Seminar)	10	NUM	116
07-MS3BB-102-m01	Biophysics and Biochemistry	10	NUM	109
07-MS3BA-102-m01	Response towards Biotic and Abiotic Factors	10	NUM	108
07-MS3S-102-m01	System Biology (Lecture and Seminar)	10	NUM	122
07-MS3SYF1-102-m01	System Biology (Practical Course and Seminar 1)	10	NUM	123
07-MS3SYF2-102-m01	System Biology (Practical Course and Seminar 2)	15	B/NB	124
07-MS2M1-112-m01	Microbiology 1 (Lecture and Seminar)	10	NUM	89
07-MS3-112-m01	Current Methods in Plant Biology (Lecture)	10	NUM	104
07-MS2M2-112-m01	Microbiology 2 (Lecture and Seminar)	10	NUM	90
Non-focus Lab Course				
07-MSL2-102-m01	Laboratory practical course 2	10	B/NB	133
07-MSL3-102-m01	Laboratory practical course 3	15	B/NB	134
07-MSA2-102-m01	Practical Course as exchange student 2	10	B/NB	127
07-MSA3-102-m01	Practical Course as exchange student 3	15	B/NB	128
Compulsory Electives 2 (15 ECTS credits)				
07-MBI-B-121-m01	Bioinformatics B	5	B/NB	28

07-MS-B-121-m01	Systems Biology B	5	B/NB	129
07-MLS1-122-m01	Methods in Life Sciences	10	NUM	43
07-MLS2-122-m01	Topics and Concepts in Life Sciences	10	NUM	45
07-MSCC-111-m01	Biochemistry, Physiology and Genetics of Mammalian Cell Culture	5	B/NB	130
03-MSMT-111-m01	Molecular Techniques	3	B/NB	15
07-ML-122-m01	Linux and Perl	5	B/NB	42
07-MS3B-121-m01	Current Methods in Plant Biology B	7	B/NB	106
07-MPAB-121-m01	Developmental Physiology and Adaption of Plants B	7	B/NB	52
07-MBAB-121-m01	Response towards Biotic and Abiotic Factors B	7	B/NB	26
07-MBBB-121-m01	Biophysics and Biochemistry B	5	B/NB	27
07-MS1B-121-m01	Neurobiology, Behaviour and Animal Ecology B	7	B/NB	55
07-MNBB-121-m01	Neurogenetics of Behaviour B	5	B/NB	51
07-MECB-121-m01	Endogenous Clocks	5	B/NB	29
07-MTÖB-121-m01	Animal Ecology and Tropical Biology	5	B/NB	138
07-MTÖ2B-121-m01	Animal Ecology and Tropical Biology 2 B	5	B/NB	137
07-MKB-121-m01	Communication Biology B	7	B/NB	40
07-MESB-121-m01	Experimental Sociobiology B	7	B/NB	33
07-MS2B-121-m01	Molecular Biology B	7	B/NB	74
07-MM1-B-121-m01	Microbiology 1 B	5	B/NB	47
07-MM2-B-121-m01	Microbiology 2 B	5	B/NB	48
07-MZE1-B-121-m01	Cell- and Development-Biology Master 1 B	3	B/NB	152
07-MZE2-B-121-m01	Cell- and Development-Biology Master 2 B	3	B/NB	153
03-MIM1-B-121-m01	Immunology 1 B	7	B/NB	11
03-MIM2-B-121-m01	Immunology 2 B	7	B/NB	13
03-MIM1-BS-121-m01	Immunology 1 BS	5	B/NB	12
03-MIM2-BS-121-m01	Immunology 2 BS	5	B/NB	14
03-MV1-B-121-m01	Virology 1 B	7	B/NB	16
03-MV2-B-121-m01	Virology 2 B	7	B/NB	17
07-MGRSD-121-m01	Gene Regulation and Signal Transduction	3	B/NB	37
07-MMIÖK-121-m01	Microbial Ecology	3	B/NB	50
07-MHWB-121-m01	Ecology of Honey Bees and Wild Bees	3	NUM	39
07-METI-121-m01	Ecology and Taxonomy of Insects	3	NUM	34
07-MMIE-121-m01	Modelling in Ecology	3	NUM	49
07-MAGRE-121-m01	Agroecology	2	NUM	25
07-MFEC-121-m01	Forest Ecology	2	NUM	35
07-MTROP-121-m01	Tropical Ecology	5	NUM	139
07-MSET-121-m01	Seminar Experimental Animal Ecology	2	B/NB	131
07-MSL1-102-m01	Laboratory practical course 1	5	B/NB	132
07-MSA1-102-m01	Practical Course as exchange student 1	5	B/NB	126
07-MUDB-102-m01	Entrepreneurial Spirit in Biosciences	5	B/NB	140
07-MVMINT1-102-m01	Specific Curricular Activities in Biological Sciences 1	2	B/NB	146
07-MVMINT2-102-m01	Specific Curricular Activities in Biological Sciences 2	3	NUM	147
07-MVMINT3-102-m01	Specific Curricular Activities in Biological Sciences 3	4	B/NB	148
07-MVMINT4-102-m01	Specific Curricular Activities in Biological Sciences 4	5	NUM	149
07-MV1-102-m01	Extracurricular Activities Outside of Natural Sciences 1	2	B/NB	142

07-MV2-102-m01	Extracurricular Activities Outside of Natural Sciences 2	3	NUM	143
07-MV3-102-m01	Extracurricular Activities Outside of Natural Sciences 3	4	B/NB	144
07-MV4-102-m01	Extracurricular Activities Outside of Natural Sciences 4	5	NUM	145
07-DR1-102-m01	Scientific Teaching 1	2	B/NB	18
07-DR2-102-m01	Scientific Teaching 2	3	B/NB	19
07-DR3-102-m01	Scientific Teaching 3	4	B/NB	20
07-DR4-102-m01	Scientific Teaching 4	5	B/NB	21
07-FT1-102-m01	Supervising Tutorial Master 1	3	B/NB	22
07-FT2-102-m01	Supervising Tutorial Master 2	4	B/NB	23
07-FT3-102-m01	Supervising Tutorial Master 3	5	B/NB	24
07-MENMNDB-141-m01	Neuromodulation and Neuronal Development B	5	B/NB	32
07-MPWD-112-m01	Presentation of Scientific Data	5	B/NB	53
07-MGLN-112-m01	Quality Management, Good Practice, Biosafety	5	NUM	36
07-MGUG-112-m01	Brain and mind	3	B/NB	38
07-MWIG-112-m01	Epistemology and History of Science	3	B/NB	151
07-MEMB-112-m01	Entrepreneurial Management in Biosciences	10	B/NB	30
07-MVMINT5-112-m01	Specific Curricular Activities in Biological Sciences 5	6	B/NB	150
07-MLS1B-141-m01	Methods in Life Sciences	7	B/NB	44
07-MLS2B-141-m01	Topics and Concepts in Life Sciences	7	NUM	46
07-MKE-WO-121-m01	Nucleus Workshop	7	B/NB	41

Module title			Abbreviation
Immunology 1 B			03-MIM1-B-121-m01
Module coordinator		**Module offered by**	
holder of the Professorship of Immunogenetics		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
7	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Familiarity with the fundamentals of molecular and cellular immunology that allow a deeper understanding of immune-mediated defence mechanisms. This incorporates common literature readings, presentations and tests on selected immunology book chapters and recent original literature in English language.

Intended learning outcomes

Students will gain a knowledge of fundamental concepts and methods in molecular and cellular immunology and will be able to present and discuss these.

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

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

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

a) written examination (approx. 30 to 60 minutes, including multiple choice questions) or b) log (10 to 30 pages) or c) oral examination of one candidate each (approx. 30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (approx. 20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)
Master's degree (1 major) Biomedicine (2013)
Master's degree (1 major) Biomedicine (2012)

Module title			Abbreviation
Immunology 1 BS			03-MIM1-BS-121-m01
Module coordinator		**Module offered by**	
holder of the Professorship of Immunogenetics		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Familiarity with the fundamentals of molecular and cellular immunology that allow a deeper understanding of immune-mediated defence mechanisms. This incorporates common literature readings, presentations and tests on selected immunology book chapters and recent original literature in English language.

Intended learning outcomes

Students will gain a knowledge of fundamental concepts and methods in molecular and cellular immunology and will be able to present and discuss these.

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

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

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

a) written examination (approx. 30 to 60 minutes, including multiple choice questions) or b) log (10 to 30 pages) or c) oral examination of one candidate each (approx. 30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (approx. 20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)
Master's degree (1 major) Biomedicine (2013)
Master's degree (1 major) Biomedicine (2012)

Module title			Abbreviation
Immunology 2 B			03-MIM2-B-121-m01
Module coordinator		**Module offered by**	
holder of the Professorship of Immunogenetics		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
7	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Recent progress in molecular and cellular immunology. Deeper insights into selected immunology chapters , such as autoimmunity and immune modulation, development of the immune system, immunogenetics, evolution, infection immunology, and more. This incorporates common literature readings, presentations and tests on selected immunology book chapters and recent original literature.

Intended learning outcomes

Students are able to understand current problems in immunology and to discuss these in detail.

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

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

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

a) written examination (approx. 30 to 60 minutes, including multiple choice questions) or b) log (10 to 30 pages) or c) oral examination of one candidate each (approx. 30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (approx. 20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)
Master's degree (1 major) Biomedicine (2013)
Master's degree (1 major) Biomedicine (2012)

Module title			Abbreviation
Immunology 2 BS			03-MIM2-BS-121-m01
Module coordinator		**Module offered by**	
holder of the Professorship of Immunogenetics		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Recent progress in molecular and cellular immunology. Deeper insights into selected immunology chapters , such as autoimmunity and immune modulation, development of the immune system, immunogenetics, evolution, infection immunology, and more. This incorporates common literature readings, presentations and tests on selected immunology book chapters and recent original literature.

Intended learning outcomes

Students are able to understand current problems in immunology and to discuss these in detail.

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

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

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

a) written examination (approx. 30 to 60 minutes, including multiple choice questions) or b) log (10 to 30 pages) or c) oral examination of one candidate each (approx. 30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (approx. 20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)
Master's degree (1 major) Biomedicine (2013)
Master's degree (1 major) Biomedicine (2012)

Module title			Abbreviation
Molecular Techniques			03-MSMT-111-m01
Module coordinator		**Module offered by**	
Dean of the Faculty of Biology		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	graduate	--	

Contents

Introduction to new and cutting-edge molecular techniques. Methods for scientific investigation.

Intended learning outcomes

Students are familiar with cutting-edge methods and techniques and can improve experimental strategies and experimental set ups to answer scientific questions.

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

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

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

a) written examination (usually 30 to 60 minutes, including multiple choice questions) or b) log (usually approx. 10 to 30 pages) or c) oral examination of one candidate each (usually 30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (usually approx. 30 to 60 minutes) or e) presentation (usually 20 to 45 minutes)
Language of assessment: English

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)
Master's degree (1 major) FOKUS Life Sciences (2012)

Module title			Abbreviation
Virology 1 B			03-MV1-B-121-m01
Module coordinator		**Module offered by**	
holder of the Chair of Virology		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
7	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

This module will discuss contemporary topics in virology.

Intended learning outcomes

Students are able to understand current problems in virology and to discuss these in detail.

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

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

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

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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

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)
Master's degree (1 major) Biomedicine (2013)
Master's degree (1 major) Biomedicine (2012)

Module title			Abbreviation
Virology 2 B			03-MV2-B-121-m01
Module coordinator		**Module offered by**	
holder of the Chair of Virology		Faculty of Medicine	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
7	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

This module will discuss contemporary topics in virology.

Intended learning outcomes

Students are able to understand current problems in virology and to discuss these in detail.

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

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

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

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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

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)
Master's degree (1 major) Biomedicine (2013)
Master's degree (1 major) Biomedicine (2012)

Module title			Abbreviation
Scientific Teaching 1			07-DR1-102-m01
Module coordinator		**Module offered by**	
degree programme coordinator Biologie (Biology)		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
2	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	Please consult with course advisory service.	

Contents

Students contribute to and/or independently organise courses for Bachelor's students or pupils. Students organising courses will receive advice on contents and organisation from the degree programme coordinator. The course will comprise 0.5 weekly contact hours.

Intended learning outcomes

Ability to independently organise, plan and deliver courses.

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

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

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

successful completion as certified by the lecturer

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

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Scientific Teaching 2			07-DR2-102-m01
Module coordinator		**Module offered by**	
degree programme coordinator Biologie (Biology)		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
3	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	Please consult with course advisory service.	

Contents

Students contribute to and/or independently organise lectures or seminars for Bachelor's students or pupils. Students organising courses will receive advice on contents and organisation from the degree programme coordinator. The course will comprise 1 weekly contact hour.

Intended learning outcomes

Ability to independently organise, plan and deliver courses.

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

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

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

successful completion as certified by the lecturer

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

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Scientific Teaching 3			07-DR3-102-m01
Module coordinator		**Module offered by**	
degree programme coordinator Biologie (Biology)		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
4	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	Please consult with course advisory service.	

Contents

Students contribute to and/or independently organise courses for Bachelor's students or pupils. Students organising courses will receive advice on contents and organisation from the degree programme coordinator. The course will comprise 1.5 weekly contact hours.

Intended learning outcomes

Ability to independently organise, plan and deliver courses.

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

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

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

successful completion as certified by the lecturer

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

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Scientific Teaching 4			07-DR4-102-m01
Module coordinator		**Module offered by**	
degree programme coordinator Biologie (Biology)		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	Please consult with course advisory service.	

Contents

Students contribute to and/or independently organise courses for Bachelor's students or pupils. Students organising courses will receive advice on contents and organisation from the degree programme coordinator. The course will comprise 2 weekly contact hours.

Intended learning outcomes

Ability to independently organise, plan and deliver courses.

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

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

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

successful completion as certified by the lecturer

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

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Supervising Tutorial Master 1			07-FT1-102-m01
Module coordinator		**Module offered by**	
degree programme coordinator Biologie (Biology)		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
3	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	Please consult with course advisory service.	

Contents

Working as tutors, students will mentor other students during courses in particular and will help organise and design courses, in particular exercises.

Intended learning outcomes

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

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

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

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

successful completion as certified by the lecturer

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

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Supervising Tutorial Master 2			07-FT2-102-m01
Module coordinator		**Module offered by**	
degree programme coordinator Biologie (Biology)		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
4	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	Please consult with course advisory service.	

Contents

Working as tutors, students will mentor other students during courses in particular and will help organise and design courses, in particular exercises.

Intended learning outcomes

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

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

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

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

successful completion as certified by the lecturer

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

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Supervising Tutorial Master 3			07-FT3-102-m01
Module coordinator		**Module offered by**	
degree programme coordinator Biologie (Biology)		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	Please consult with course advisory service.	

Contents

Tutors will support other students on their way towards academic success.

Intended learning outcomes

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

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

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

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

successful completion as certified by the lecturer

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

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Agroecology			07-MAGRE-121-m01
Module coordinator		**Module offered by**	
holder of the Chair of Animal Ecology and Tropical Biology		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
2	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Biodiversity and ecosystem functioning in agricultural ecosystems. Insect communities in different crops, pest-beneficial organisms-interactions, and biological pest control. Experiment in comparison of organically and conventionally farmed agricultural land (plant diversity, herbivore, predator, pollinator diversity). Field trip to nature conservation-related agricultural areas (e. g. semi-arid grassland), presentation of agri-environmental measures.

Intended learning outcomes

The students will acquire knowledge about the species diversity, structure and functional role of arthropod communities in agricultural ecosystems. They will be able to perform scientific work in agricultural ecosystems, to perform statistical analyses, and to interpret the results. They will be familiar with problems and possible solutions in agricultural ecosystems in the context of a sustainable use of biodiversity and ecosystem services.

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

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

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

a) written examination (approx. 30 to 60 minutes, including multiple choice questions) or b) log (10 to 30 pages) or c) oral examination of one candidate each (approx. 30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (approx. 20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Response towards Biotic and Abiotic Factors B			07-MBAB-121-m01
Module coordinator		**Module offered by**	
holder of the Chair of Pharmaceutical Biology		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
7	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

In their natural environment, plants are constantly exposed to a variety of biotic and abiotic (stress) factors. Plant responses to these external factors lead to changes in the regulation of gene expression, the activity of enzymes and the levels of a variety of metabolites. Some of these responses lead to increased stress resistance/tolerance. The lecture will not only discuss these plant responses and the mechanisms of perception and signal transduction. It will also examine the strategies of microorganisms and herbivores for using plants as a source of nutrients.

Intended learning outcomes

Students are able to understand the interaction between plants and the environment on a molecular level and to discuss the topic in the context of the scientific state of the art.

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

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

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

a) written examination (30 to 60 minutes, including multiple choice questions) or b) oral examination of one candidate each (approx. 30 to 60 minutes) or c) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Biophysics and Biochemistry B			07-MBBB-121-m01
Module coordinator		**Module offered by**	
holder of the Chair of Plant Physiology and Biophysics		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

The module imparts theoretical and methodological knowledge of plant membrane transport, structural biology and biochemistry which is illustrated with specific examples from current research. Depending on the number of participants and their interests, practical demonstrations of methods that are currently used give students an opportunity to experience the practical aspects of biophysical and biochemical research.

Intended learning outcomes

Students are able to use methods dealing with soluble proteins or membrane proteins in the fields of biophysics, structural biology and biochemistry. They are able to interpret the data and to discuss the results within the context of current knowledge.

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

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

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

a) written examination (30 to 60 minutes, including multiple choice questions) or b) oral examination of one candidate each (approx. 30 to 60 minutes) or c) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Bioinformatics B			07-MBI-B-121-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	(not) successfully completed	--	
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 (no information on SWS (weekly contact hours) and course language available)

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

Students will be informed about the method, length and scope of the assessment prior to the course. a) written examination (30 to 60 minutes, including multiple choice questions) or b) oral examination of one candidate each (30 to 60 minutes) or c) oral examination in groups of up to 3 candidates (30 to 60 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)
Master's degree (1 major) Mathematics (2012)
Master's degree (1 major) Biomedicine (2013)
Master's degree (1 major) Biomedicine (2012)
Master's degree (1 major) Computational Mathematics (2012)

Module title			Abbreviation
Endogenous Clocks			07-MECB-121-m01
Module coordinator		**Module offered by**	
holder of the Chair of Neurobiology and Genetics		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Introduction into endogenous clocks of unicellular organisms, fungi, plants and animals, with a focus on the neuronal organisation of the clock in the brain of mammals and insects. The biological functions of endogenous clocks and the underlying mechanisms will be discussed on the molecular, cellular and organismic levels. It will be explained how clocks adjust to a 24h day with variable photoperiods. Applied aspects regarding e. g. shift work or jetlag will also be discussed.

Intended learning outcomes

The students learn fundamental principles underlying chronobiology/endogenous clocks and obtain an insight into current research in the field.

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

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

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

a) written examination (30 to 60 minutes, including multiple choice questions) or b) oral examination of one candidate each (approx. 30 to 60 minutes) or c) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Entrepreneurial Management in Biosciences			07-MEMB-112-m01
Module coordinator		**Module offered by**	
Coordinator BioCareers		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Overview of the bioscience sector with a particular focus on research and development, fundamental methods and technologies, recent developments and trends in established as well as up-and-coming high-tech industries, legal framework, financing and business models, best practice examples of start-ups as well as established companies, criteria of project-based work, characteristics and elements of project work, case studies, project work in interdisciplinary teams of students where possible, selected guest lectures giving the course practical relevance.

Intended learning outcomes

Students have acquired an insight into industries and developments in the natural sciences. They are familiar with the characteristics of industries and established businesses as well as with specific characteristics of start-up companies and up-and-coming technologies. Students are also familiar with the criteria of project-based work and have gained experience working in interdisciplinary teams. They are better qualified to evaluate what approaches or methods from individual disciplines are most suitable for solving a particular problem. The experience of interdisciplinary project work students have acquired will help them enhance their entrepreneurial 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.

- 07-MEMB-1-102: S (no information on SWS (weekly contact hours) and course language available)
- 07-MEMB-2-112: S (no information on SWS (weekly contact hours) and course language available)

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

Assessment in this module comprises the assessments in the individual module components as specified below. Unless stated otherwise, successful completion of the module will require successful completion of all individual assessments.

Assessment in module component 07-MEMB-1-102: Basics in the Management of Natural Sciences

- 5 ECTS, Method of grading: (not) successfully completed
- Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Assessment in module component 07-MEMB-2-112: Project Management

- 5 ECTS, Method of grading: (not) successfully completed
- Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Allocation of places

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Additional information
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Workload
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Teaching cycle
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Referred to in LPO I (examination regulations for teaching-degree programmes)
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Module appears in
Master's degree (1 major) Biology (2011) Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Neuromodulation and Neuronal Development B			07-MENMNDB-141-m01
Module coordinator		**Module offered by**	
holder of the Chair of Neurobiology and Genetics		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Neuromodulation: cellular and molecular biology of neuromodulators and their receptors, modulation of synaptic transmission and membrane potential, theoretical and functional aspects of neuromodulation, model systems used to study modulation of neuronal circuits. Fundamental principles of molecular developmental neurobiology. Focus is on the establishment of the neuroectoderm, pattern generation and regional specification, neuronal precursors, neuronal growth, differentiation of neurons, axonal pathfinding, neuronal connectivity.

Intended learning outcomes

The students learn fundamental principles underlying neuromodulation and neuronal development and obtain an insight into current research in the field.

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

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

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

a) written examination (30 to 60 minutes, including multiple choice questions) or b) oral examination of one candidate each (30 to 60 minutes) or c) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)

Module title			Abbreviation
Experimental Sociobiology B			07-MESB-121-m01
Module coordinator		**Module offered by**	
holder of the Chair of Behavioral Physiology and Sociobiology		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
7	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

The lectures highlight the diversity and the evolution of social behaviour, but also focus on the physiological, neurobiological and behavioural mechanisms underlying the organisation of social groups. In a follow-up seminar session, students will deepen their knowledge by presenting and discussing current papers related to the topic of the lecture.

Intended learning outcomes

Students understand the value of an integrative approach when looking at complex correlations in behavioural biology. Students are able to recognise and interpret relationships between various aspects of sociobiology. They are able to formulate scientific questions in the context of sociobiology and are able to discuss cutting edge literature in depth.

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

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

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

a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (approx. 30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (approx. 20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Ecology and Taxonomy of Insects			07-METI-121-m01
Module coordinator		**Module offered by**	
holder of the Chair of Animal Ecology and Tropical Biology		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
3	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Identification and classification of the characteristics of different groups of arthropods, especially insects. Knowledge of special form is provided. Observation and recording of arthropods in habitat. Experimental laboratory and field work on ecological or behaviour biological characteristics of the respective groups of arthropods. In addition, compilation of species richness and niche differentiation. The aim is to link the phylogenetic and morphological characteristics of arthropods with their ecological functions.

Intended learning outcomes

The students will be able to identify typical families and representatives of major insect orders. They will be able to apply special identification keys as well as to record and evaluate special behaviours. They will be able to design and evaluate experimental approaches in ecological laboratory and field studies.

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

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

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

a) written examination (approx. 30 to 60 minutes, including multiple choice questions) or b) log (10 to 30 pages) or c) oral examination of one candidate each (approx. 30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (approx. 20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Forest Ecology			07-MFEC-121-m01
Module coordinator		**Module offered by**	
holder of the Chair of Animal Ecology and Tropical Biology		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
2	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Arthropod communities in forest ecosystems, methods for detection, influence of management on diversity patterns and functional groups. The course includes field studies in forest ecosystems and work of determination as well as the statistical analysis of data.

Intended learning outcomes

The students will acquire knowledge of the species diversity, structure and functional role of arthropod communities in forests. On the basis of complex data sets, they will learn to analyse and discuss the structuring patterns of communities. In this context, the course will also discuss associated conservation-related aspects.

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

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

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

a) written examination (approx. 30 to 60 minutes, including multiple choice questions) or b) log (10 to 30 pages) or c) oral examination of one candidate each (approx. 30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (approx. 20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Quality Management, Good Practice, Biosafety			07-MGLN-112-m01
Module coordinator		**Module offered by**	
Coordinator BioCareers		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Political instruments to conserve biodiversity (convention on biodiversity (CBD), German strategy on biodiversity) as well as corporate social responsibility in the private economy, sponsoring and marketing are discussed. These topics are critically analysed with regard to sustainability, credibility and effectiveness. In addition, the students become familiar with strategies to prevent biodiversity loss and actively contribute to these activities. Good practice in the biosciences, quality assurance approaches and quality culture. Structure, idea and fundamental principles of quality management approaches, DIN EN ISO 9001, regulatory documents and framework in the biosciences including biotechnology, biosafety, biosecurity, risk assessment.

Intended learning outcomes

The students know relevant international conventions and German regulations on the conservation of biodiversity. They have become familiar with the regulatory and political framework for the conservation of biodiversity. They are aware of corporate responsibilities in this regard and know how to support cooperative approaches among companies and organisations on environmental protection. The students are familiar with the fundamental principles of "good practice" in research and development, and have understood the fundamental principles of quality management circles. They have developed a distinct sensitivity towards biosafety and biosecurity issues and know how to properly handle biological agents and organisms, including GMOs. In addition, they have developed a sensitivity towards the complex interdependencies in nature and are able to critically discuss socio-ethical issues in the bioscience area. Students possess the knowledge and skills required of a biosafety officer and are qualified for working in CSR or environmental management at major enterprises or mediating between environmental organisations, governments and the private sector.

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

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

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

written examination (approx. 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

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Gene Regulation and Signal Transduction			07-MGRSD-121-m01
Module coordinator		**Module offered by**	
Dean of Studies Biologie (Biology)		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
3	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

In this lecture, important aspects of gene regulation and signal transduction of bacteria will be described and discussed. The lecture will discuss regulatory mechanisms on the transcriptional and post transcriptional level. Whenever appropriate, special emphasis will be placed on regulatory phenomena in pathogenic bacteria.

Intended learning outcomes

Students have gained an insight into current technologies and are able to choose the appropriate technology to solve a scientific problem.

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

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

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

a) written examination (approx. 30 to 60 minutes, including multiple choice questions) or b) oral examination of one candidate each (approx. 30 to 60 minutes) or c) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Brain and mind			07-MGUG-112-m01
Module coordinator		**Module offered by**	
Coordinator BioCareers		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
3	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Philosophical foundations and scientific principles, history and theory of mind, human memory, intentional decision making and biochemical principles of cognitive and emotional processes. Fundamental terms and principles in biology are discussed.

Intended learning outcomes

The students are familiar with the hallmarks of the history of natural sciences. They have developed an increased awareness of how to use fundamental terms and definitions as well as of risks and concerns arising with knowledge and technical developments in the biosciences.

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

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

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

Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Ecology of Honey Bees and Wild Bees			07-MHWB-121-m01
Module coordinator		**Module offered by**	
holder of the Chair of Animal Ecology and Tropical Biology		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
3	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Introduction to the life of honeybees and wild bees; principles and techniques of beekeeping (colony management, breeding, diseases); resource use of honeybees and wild bees (bee dances, flower visiting, pollen analysis, foraging behaviour, nesting aid); taxonomy of wild bees, opponents of bees, wild bees in different habitats (field trip), honeybee field trip, e. g. visit to the bee centre in Veitshöchheim.

Intended learning outcomes

The students will expand their knowledge on the biology and ecology of wild and honeybees, on interactions between bees and plants, and on aspects of nature conservation. They will be proficient in experimental methods of pollination ecology, the management of trial colonies, pollen analysis, and the determination of wild bees.

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

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

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

a) written examination (approx. 30 to 60 minutes, including multiple choice questions) or b) log (10 to 30 pages) or c) oral examination of one candidate each (approx. 30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (approx. 20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Communication Biology B			07-MKB-121-m01
Module coordinator		**Module offered by**	
holder of the Chair of Behavioral Physiology and Sociobiology		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
7	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

The lectures deal with physiological and neurobiological principles of the different communication channels used by animals, but also highlight adaptive values and evolutionary aspects of animal signalling.

Intended learning outcomes

Students understand the value of an integrative approach when looking at complex issues in biology. They have learned to connect findings from different research areas, such as physiology, neurobiology, behaviour and ecological conditions, in order to gain a more complete picture of a topic. In addition, students have learned to present and discuss current scientific publications within a broader theoretical framework.

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

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

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

a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (approx. 30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (approx. 20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Nucleus Workshop			07-MKE-WO-121-m01
Module coordinator		**Module offered by**	
degree programme coordinator Biologie (Biology)		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
7	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

This course will use a combination of lectures (daily) and practical experiments. Topics to be covered in the lecture (subject to change): - nuclear envelope, nuclear pores and nuclear-cytoplasmic transport. - nuclear envelope, nuclear lamina and their role in chromatin organisation and genetic diseases. - DNA, chromatin and chromosomes. - structure and function of nucleoli. - nuclear-cytoskeletal interactions.

Intended learning outcomes

Students are able to perform practical experiments, applying their theoretical knowledge.

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

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

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

Students will be informed about the method, length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) oral examination of one candidate each (30 to 60 minutes) or c) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)
Master's degree (1 major) Biomedicine (2013)
Master's degree (1 major) Biomedicine (2012)

Module title			Abbreviation
Linux and Perl			07-ML-122-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	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Introduction to the Linux operating system, writing computer programs using the programming language Perl to answer bioinformatic questions.

Intended learning outcomes

Students are able to use Linux as user and to write simple Perl scripts to answer bioinformatic questions.

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

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

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

a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (approx. 30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Methods in Life Sciences			07-MLS1-122-m01
Module coordinator		**Module offered by**	
Dean of Studies Biologie (Biology)		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Versioned molecular techniques, lipid research methods, microscopic methods, immunohistochemistry, mouse models and gene-knockout approaches, protein and molecular biology techniques, PCR, advanced protein biochemistry, methods in bioinformatics and computational biology.

Intended learning outcomes

Students are able to review and expand their knowledge of standard molecular techniques and are able to choose methods and techniques to design experiments in a specific research area.

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

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

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

a) written examination (usually 30 to 60 minutes, including multiple choice questions) or b) oral examination of one candidate each (usually 30 to 60 minutes) or c) oral examination in groups of up to 3 candidates (usually approx. 30 to 60 minutes)
Language of assessment: English

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)
Master's degree (1 major) FOKUS Life Sciences (2012)

Module title			Abbreviation
Methods in Life Sciences			07-MLS1B-141-m01
Module coordinator		**Module offered by**	
degree programme coordinator Biologie (Biology)		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
7	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Versioned molecular techniques, lipid research methods, microscopic methods, immunohistochemistry, mouse models and gene-knockout approaches, protein and molecular biology techniques, PCR, advanced protein biochemistry, methods in bioinformatics and computational biology.

Intended learning outcomes

Students are able to review and expand their knowledge of standard molecular techniques and are able to choose methods and techniques to design experiments in a specific research area.

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

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

- 07-MLS1B-1-141: V (no information on language and number of weekly contact hours available)
- 04-MLS1B-1-141: V (no information on language and number of weekly contact hours available)

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

This module has the following 2 assessment components. To pass the module as a whole students must pass one of the two assessment components.

Assessment component to module component 07-MLS1B-1-141: Methoden in den Lebenswissenschaften

- 7 ECTS credits, method of grading: (not) successfully completed
- a) written examination (30-60 minutes, including multiple choice questions) or b) log (ca.10-30 pages) or c) oral examination of on candidate each (30-60 minutes) or d) oral examination in groups up to three candidates (approx. 30-60 minutes) or e) presentation (20-45 minutes). Students will be informed about the method, length and scope of the assessment prior to the course.
- Language of assessment: English

Assessment component to module component 04-MLS1B-1-141: Methoden in den Lebenswissenschaften

- 7 ECTS credits, method of grading: (not) successfully completed
- written examination or oral examination of an candidate each or in groups up to three candidates.
- Language of assessment: English

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Topics and Concepts in Life Sciences			07-MLS2-122-m01
Module coordinator		**Module offered by**	
Dean of Studies Biologie (Biology)		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

A broad variety of topics and concepts from the areas of neuroscience, infection and immunity, integrative biology, and biomedicine including for example: protein characterisation, DNA repair, Drosophila, computational biology, and neurocircuits.

Intended learning outcomes

Students have an overview of the current research topics in the Graduate School of Life Sciences and are able to explain their significance and scientific background.

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

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

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

a) written examination (usually 30 to 60 minutes, including multiple choice questions) or b) oral examination of one candidate each (usually 30 to 60 minutes) or c) oral examination in groups of up to 3 candidates (usually approx. 30 to 60 minutes)
Language of assessment: English

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)
Master's degree (1 major) FOKUS Life Sciences (2012)

Module title			Abbreviation
Topics and Concepts in Life Sciences			07-MLS2B-141-m01
Module coordinator		**Module offered by**	
degree programme coordinator Biologie (Biology)		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
7	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

A broad variety of topics and concepts from the areas of neuroscience, infection and immunity, integrative biology, and biomedicine including for example: protein characterisation, DNA repair, Drosophila, computational biology, and neurocircuits.

Intended learning outcomes

Students have an overview of the current research topics in the Graduate School of Life Sciences and are able to explain their significance and scientific background.

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

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

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

written examination or oral examination of one candidate each or oral examination in groups of up to 3 candidates
Language of assessment: English

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Microbiology 1 B			07-MM1-B-121-m01
Module coordinator		**Module offered by**	
holder of the Chair of Microbiology		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Fundamentals of molecular microbiology and infection biology, mechanisms of adherence and invasion, bacterial pathogenicity factors, regulation of virulence, mechanisms of host defence and pathogen interference, current methods in infection biology.

Intended learning outcomes

The students are able to understand fundamental theories of molecular microbiology and infection biology, emergence of infectious diseases.

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

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

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

a) written examination (30 to 60 minutes, including multiple choice questions) or b) oral examination of one candidate each (approx. 30 to 60 minutes) or c) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)
Master's degree (1 major) Biomedicine (2013)
Master's degree (1 major) Biomedicine (2012)

Module title			Abbreviation
Microbiology 2 B			07-MM2-B-121-m01
Module coordinator		**Module offered by**	
holder of the Chair of Microbiology		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Fundamental principles of the mode of action of microbial pathogenicity factors will be presented using selected prokaryotic and eukaryotic pathogens as model organisms. In addition, current research methods in infection biology will be presented.

Intended learning outcomes

Students have gained fundamental knowledge in infection biology and pathogenicity research and the mechanisms behind infectious diseases.

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

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

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

a) written examination (30 to 60 minutes, including multiple choice questions) or b) oral examination of one candidate each (approx. 30 to 60 minutes) or c) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)
Master's degree (1 major) Biomedicine (2013)
Master's degree (1 major) Biomedicine (2012)

Module title			Abbreviation
Modelling in Ecology			07-MMIE-121-m01
Module coordinator		**Module offered by**	
holder of the Chair of Animal Ecology and Tropical Biology		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
3	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Based on selected topics in ecology, students will become familiar with a variety of simulation and modelling techniques. They will also develop their own programs for the simulation of problems in the fields of demography or evolution.

Intended learning outcomes

Students have gained knowledge on selected topics in ecology and are familiar with a variety of simulation and modelling techniques. They are to develop their own programs for the simulation of problems in the field of demography or evolution.

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

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

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

a) written examination (approx. 30 to 60 minutes, including multiple choice questions) or b) log (10 to 30 pages) or c) oral examination of one candidate each (approx. 30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (approx. 20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Microbial Ecology			07-MMIÖK-121-m01
Module coordinator		**Module offered by**	
Dean of Studies Biologie (Biology)		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
3	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

This lecture deals with fundamental principles of the interaction of bacteria with their environment. A major emphasis is laid on the interaction of mutualistic bacteria with other organisms including bacteria, invertebrates and vertebrates and, where appropriate, the comparison with commensal and pathogenic interactions. The lecture complements the focus Infektionsbiologie (Infection Biology) of the degree programme Zelluläre und Molekulare Mikrobiologie / Infektionsbiologie (Cellular and Molecular Biology / Infection Biology) in which mainly human pathogens and their host interaction mechanisms are presented. Thus, the lecture intends to identify and describe fundamental concepts of the interaction of bacteria with different host organisms.

Intended learning outcomes

Students have gained an insight into current technologies and are able to choose the appropriate technology to solve a scientific problem.

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

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

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

a) written examination (approx. 30 to 60 minutes, including multiple choice questions) or b) oral examination of one candidate each (approx. 30 to 60 minutes) or c) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Neurogenetics of Behaviour B			07-MNBB-121-m01
Module coordinator		**Module offered by**	
holder of the Chair of Neurobiology and Genetics		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

To understand how the brain controls behaviour is at the heart of neuroscience. Both brain and behaviour can be overwhelmingly complex and plastic, yet neurogenetic methods are powerful tools to dissect the principles of how the brain controls behaviour. The lecture and seminar will give a state-of-the art view on current and important topics of behavioural neurobiology (incl. e. g. sleep, control of appetite and feeding, social behaviour, mating, mirror neurons, molecular mechanisms of auditory-guided behaviour, neurogenetic techniques) focusing on genetic model systems such as the fruit fly Drosophila, the mouse, and the nematode C. elegans.

Intended learning outcomes

In the lecture, students acquire theoretical and methodological insights into current topics in the field of neurogenetics in general and the neurogenetics of behaviour.

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

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

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

a) written examination (30 to 60 minutes, including multiple choice questions) or b) oral examination of one candidate each (approx. 30 to 60 minutes) or c) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Developmental Physiology and Adaption of Plants B			07-MPAB-121-m01
Module coordinator		**Module offered by**	
holder of the Chair of Plant Physiology and Biophysics		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
7	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Section Developmental Physiology: The lecture will discuss the physiological processes occurring during ontogeny as well as the reaction of plants to various environmental parameters. It will focus on introducing students to the molecular components (ABA, auxin, ethylene etc.) of signalling networks and explaining their biosynthesis, regulation and functioning. Current journal articles on the topics will be presented and discussed in the seminar. Section Adaptation: The lecture will deal with the ecological and environmental constraints under which plants grow and develop (biogeography, biodiversity) and with the interactions of plants with abiotic and biotic environmental factors (e. g. plant-insect, plant-fungus interactions). The evolutionary adaptations on the physiological and organismic level will be emphasised in particular (stress and defence reactions, carnivory, plant protection). Based on selected examples from current research, the seminar will address the topics covered in the lecture in more detail. It will be complemented by topic-related guided tours in the Botanical Garden of the University of Würzburg.

Intended learning outcomes

Students are qualified to recognise ecological and physiological relations and are able to interpret and discuss these relations in the context of the current state of knowledge.

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

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

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

a) written examination (30 to 60 minutes, including multiple choice questions) or b) oral examination of one candidate each (approx. 30 to 60 minutes) or c) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Presentation of Scientific Data			07-MPWD-112-m01
Module coordinator		**Module offered by**	
Coordinator BioCareers		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Principles for the preparation of scientific manuscripts, citations and the presentation of scientific data. Students will write a scientific mini review and present this in a talk (15 minutes). Content, structure, coherence and the logical chain of arguments will be discussed. Students will write and publish (where possible) a scientific paper or review on a selected topic in a scientific journal. The students' work will be based on original papers as well as on reviews and will follow the instructions of a scientific journal of the students' choice. These instructions can be found on the website of the respective journal under "Instructions to Authors" or similar. Both length of chapters and structure of the article should be based on the style of the journal selected. Attendance of no less than 20 scientific talks (e. g. defences of doctoral theses, presentations of research projects, retreats) including presentations by guest speakers. Students are to obtain proof of attendance from the organisers or speakers.

Intended learning outcomes

The students are familiar with the details of publishing scientific data in written and oral form. They have become familiar with the methodology of scientific publishing in oral or written fashion. In addition, they have enhanced their English reading, speaking and writing skills.

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

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

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

Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Allocation of places

Biology Master's: no restrictions. Biochemistry Master's: 10 places. Places will be allocated by lot.

Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biochemistry (2012)
Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Neurobiology, Behavior and Animal Ecology (Lecture)			07-MS1-102-m01
Module coordinator		**Module offered by**	
holder of the Chair of Neurobiology and Genetics		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

This lecture series is a joint activity of the Chairs of Neurobiology, Behavioural Physiology and Animal Ecology. It will provide students with insights into these fields, helping them select their F1 and F2 practical courses and providing them with the fundamental knowledge and skills required for the advanced modules of this focus.

Intended learning outcomes

Students get to know the advantages of an integrative approach when analysing complex biological systems. They learn to relate and integrate different fields within biology.

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

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

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

Students will be informed about the method, length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) oral examination of one candidate each (30 to 60 minutes) or c) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Neurobiology, Behaviour and Animal Ecology B			07-MS1B-121-m01
Module coordinator		**Module offered by**	
holder of the Chair of Neurobiology and Genetics		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
7	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

This lecture series is a joint activity of the Chairs of Neurobiology, Behavioural Physiology and Animal Ecology. It will provide students with insights into these fields, helping them select their F1 and F2 practical courses and providing them with the fundamental knowledge and skills required for the advanced modules of this focus.

Intended learning outcomes

Students get to know the advantages of an integrative approach when analysing complex biological systems. They learn to relate and integrate different fields within biology.

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

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

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

a) written examination (30 to 60 minutes, including multiple choice questions) or b) oral examination of one candidate each (approx. 30 to 60 minutes) or c) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Endogenous Clocks			07-MS1CB-141-m01
Module coordinator		**Module offered by**	
holder of the Chair of Neurobiology and Genetics		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Introduction into endogenous clocks of unicellular organisms, fungi, plants and animals, with a focus on the neuronal organisation of the clock in the brain of mammals and insects. The biological functions of endogenous clocks and the underlying mechanisms will be discussed on the molecular, cellular and organismic levels. It will be explained how clocks adjust to a 24h day with variable photoperiods. Applied aspects regarding e. g. shift work or jetlag will also be discussed.

Intended learning outcomes

The students learn fundamental principles underlying chronobiology/endogenous clocks and obtain an insight into current research in the field. In the seminar, they practise their presentation skills and the discussion of research findings in English.

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

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

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

written examination or oral examination of one candidate each or oral examination in groups of up to 3 candidates

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

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Experimental Sociobiology			07-MS1ES-111-m01
Module coordinator		**Module offered by**	
holder of the Chair of Behavioral Physiology and Sociobiology		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

The lecture covers the diversity and the development of social behaviour as well as the behavioural physiology and mechanisms of neurobiology that are the basis of the organisation of social groups. A special focus is on current research in the Faculty. With the help of selected publications, the seminar will discuss and explore in more detail the topics covered in the lecture.

Intended learning outcomes

Students understand the value of an integrative approach when looking at complex correlations in behavioural biology. Students are able to recognise and interpret relationships between various aspects of sociobiology. They are able to formulate scientific questions in the context of sociobiology and are able to discuss cutting edge literature in depth.

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

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

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

a) written examination (usually 30 to 60 minutes, including multiple choice questions) or b) log (usually approx. 10 to 30 pages) or c) oral examination of one candidate each (usually 30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (usually approx. 30 to 60 minutes) or e) presentation (usually 20 to 45 minutes)
Language of assessment: English

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)
Master's degree (1 major) FOKUS Life Sciences (2012)

Module title			Abbreviation
Communication Biology (Lecture)			07-MS1K-102-m01
Module coordinator		**Module offered by**	
holder of the Chair of Behavioral Physiology and Sociobiology		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

The lectures deal with physiological and neurobiological principles of the different communication channels used by animals, but also highlight adaptive values and evolutionary aspects of animal signalling. In a follow-up seminar session, students will deepen their knowledge by presenting and discussing current papers related to the topic of the lecture.

Intended learning outcomes

Students understand the value of an integrative approach when looking at complex issues in biology. They have learned to connect findings from different research areas, such as physiology, neurobiology, behaviour and ecological conditions, in order to gain a more complete picture of a topic. In addition, students have learned to present and discuss current scientific publications within a broader theoretical framework.

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

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

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

Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Molecular and Clinical Neurobiology (Lecture and Seminar)			07-MS1N-102-m01
Module coordinator		**Module offered by**	
Prof. Dr. M. Sendtner		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Content of the lecture *Molekulare und klinische Neurobiologie* (*Molecular and Clinical Neurobiology*) - cells of the nervous system, properties of neurons and glial cells - ion channels and excitability of membranes, channelopathies - synapses, transmitter release, neuromuscular end plate, Myasthenia gravis - motor activity, anatomy of the human motor system, spinal reflexes, motor neuron diseases - cerebellum, ataxia and basal ganglia, Morbus Parkinson - muscles and muscle diseases - somatosensory system and pain - hippocampus, learning and memory, anterograde amnesia, visual agnosia - cortex, Morbus Alzheimer - sleep, EEG, epilepsy - sensory physiology, vision, diseases of the visual system; Reading: Kandel, Principles of Neural Science, 4th Edition: A detailed description of this course is also available at http://neurobiologie.uk-wuerzburg.de/lehrveranstaltungen.html. The lecture Molecular and Clinical Neurobiology (incl. seminar) and *Neuroentwicklungsbiologie* (*Neurodevelopment*; Fridays 8-9 a. m.) together form one theoretical module (10 ECTS). However, you may also complete these two modules separately and have them credited within the area of mandatory electives 2.

Intended learning outcomes

Theoretical foundations of molecular and clinical neurobiology, developmental mechanisms of neuronal diseases.

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

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

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

Students will be informed about the method, length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) oral examination of one candidate each (30 to 60 minutes) or c) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Neurogenetics of Behavior			07-MS1NB-112-m01
Module coordinator		**Module offered by**	
holder of the Chair of Neurobiology and Genetics		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

To understand how the brain controls behaviour is at the heart of neuroscience. Both brain and behaviour can be overwhelmingly complex and plastic, yet neurogenetic methods are powerful tools to dissect the principles of how the brain controls behaviour. The lecture and seminar will give a state-of-the art view on current and important topics of behavioural neurobiology (incl. e. g. sleep, control of appetite and feeding, social behaviour, mating, mirror neurons, molecular mechanisms of auditory-guided behaviour, neurogenetic techniques) focusing on genetic model systems such as the fruit fly Drosophila, the mouse, and the nematode C. elegans.

Intended learning outcomes

In the lecture, students acquire theoretical and methodological insights into current topics in the field of neurogenetics in general and the neurogenetics of behaviour. In the seminar, students practise presenting and discussing research findings in English.

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

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

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

a) written examination (30 to 60 minutes, including multiple choice questions) or b) oral examination of one candidate each (30 to 60 minutes) or c) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)
Master's degree (1 major) FOKUS Life Sciences (2012)

Module title			Abbreviation
Developmental Neurobiology and Chronobiology			07-MS1NEC-112-m01
Module coordinator		**Module offered by**	
holder of the Chair of Neurobiology and Genetics		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Lecture and seminar *Endogenous Clocks*: Students acquire an overview of endogenous clocks in unicellular organisms, fungi, plants, and animals with a focus on the neuronal organisation of the endogenous clock in the brain of mammals and insects. Students learn about the biological purpose of endogenous clocks, their function on a molecular, cellular, and organismic level, as well as their adaptation to 24 hour days with varying hours of daylight. Related aspects of jetlag and shift-work are discussed. Lecture *Neuronal Development*: Fundamentals of neuronal development on the molecular level. Main focus is the establishment of the neuroectoderm, pattern formation, regional subdivision, neuronal progenitor cells, cell growth, differentiation of neurons, axonal navigation, and neuronal circuitry.

Intended learning outcomes

Students acquire a fundamental knowledge and understanding of endogenous clocks and neuronal development and gain an insight into current research. Students also learn to independently work on reading assignments and to research specific questions that arise in their reading. Results of the students' independent study are critically discussed in the seminar.

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

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

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

Students will be informed about the method, length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) oral examination of one candidate each (30 to 60 minutes) or c) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)
Master's degree (1 major) FOKUS Life Sciences (2012)

Module title			Abbreviation
Neurobiology (Practical Course and Seminar 1)			07-MS1NF1-102-m01
Module coordinator		**Module offered by**	
holder of the Chair of Neurobiology and Genetics		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

A current topic in the field of neurobiology will be investigated. The practical course will be offered in different specialisations: molecular, clinical, cellular, developmental or behavioural neurobiology or in neurogenetics. In addition to a literature search, a variety of neurobiological methods (for example: electrophysiology, immunohistochemistry, molecular biological techniques, clinical and neurogenetic techniques) and different model systems are offered. The experimental results will be documented and presented in the form of a scientific talk, a publication or a seminar paper.

Intended learning outcomes

The participants are able to conduct scientific research within the field of neurobiology. They have acquired the knowledge and skills (e. g. basic and advanced knowledge, special knowledge, advanced methodological background, general and specific methods) to carry out and document neurobiological experiments according to best practice.

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

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

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

Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Neurobiology (Practical Course and Seminar 2)			07-MS1NF2-102-m01
Module coordinator		**Module offered by**	
holder of the Chair of Neurobiology and Genetics		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
15	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

The students will independently work on a smaller project within a current line of research at the Chair. Neurobiological, genetic or molecular techniques will be tested and adapted according to the research aim. The progress of the experiments and the current line of research will be documented and presented in the form of a scientific talk, a publication or a seminar paper.

Intended learning outcomes

The participants are able to independently conduct scientific research within the field of neurobiology and to adapt a research plan according to the experimental progress. They have acquired the knowledge and skills (e. g. basic and advanced knowledge, special knowledge, advanced methodological background, general and specific methods) to independently carry out, document and interpret neurobiological experiments according to best practice.

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

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

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

Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Neuromodulation and Neuronal Development			07-MS1NMND-141-m01
Module coordinator		**Module offered by**	
holder of the Chair of Neurobiology and Genetics		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Neuromodulation: cellular and molecular biology of neuromodulators and their receptors, modulation of synaptic transmission and membrane potential, theoretical and functional aspects of neuromodulation, model systems used to study modulation of neuronal circuits. Fundamental principles of molecular developmental neurobiology. Focus is on the establishment of the neuroectoderm, pattern generation and regional specification, neuronal precursors, neuronal growth, differentiation of neurons, axonal pathfinding, neuronal connectivity.

Intended learning outcomes

The students learn fundamental principles underlying neuromodulation and neuronal development and obtain an insight into current research in the field.

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

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

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

written examination or oral examination of one candidate each or oral examination in groups of up to 3 candidates

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

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Animal Ecology and Tropical Biology (Lecture and Seminar)			07-MS1TÖ-102-m01
Module coordinator		**Module offered by**	
holder of the Chair of Animal Ecology and Tropical Biology		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

This module consists of a lecture and a seminar. The lecture gives an overview of the theoretical foundations and current issues in animal ecology. Focus will be on biodiversity and ecosystem functions, multi-trophic interactions and food nets, evolutionary ecology, chemical ecology, tropical ecology, agricultural ecology, and global change. In the seminar, recent scientific publications within the topics mentioned above will be presented and discussed.

Intended learning outcomes

The students will acquire an advanced knowledge of ecological theories and current research issues in the field of animal ecology. They will be able to interpret scientific publications and apply the acquired knowledge to the solution of current environmental risks.

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

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

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

Students will be informed about the method, length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) oral examination of one candidate each (30 to 60 minutes) or c) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Animal Ecology and Tropical Biology 2			07-MS1TÖ2-111-m01
Module coordinator		**Module offered by**	
holder of the Chair of Animal Ecology and Tropical Biology		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

This module provides the fundamentals of the biology of tropical habitats and tropical communities. A special focus is on the global significance of tropical systems (ecosystem goods and ecosystem services), but the biological features of these highly diverse biomes are also highlighted.

Intended learning outcomes

The students will acquire deep knowledge of ecological theories and up-to-date research issues in the field of animal ecology of the tropics. They will be qualified to interpret scientific work and apply the knowledge they have acquired to the solution of current environmental risks.

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

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

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

a) written examination (30 to 60 minutes, including multiple choice questions) or b) oral examination of one candidate each (approx. 30 to 60 minutes) or c) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Animal Ecology F1 (Practical Course and Seminar 1)			07-MS1TÖF1-102-m01
Module coordinator		**Module offered by**	
holder of the Chair of Animal Ecology and Tropical Biology		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	Admission prerequisite to assessment: regular attendance of lab course and successful completion of the respective exercises as specified at the beginning of the course.	

Contents

This module consists of several exercises and a seminar series over the course of the entire semester. The exercises can be chosen from the following electives: 1. Wild and honeybee ecology (over the course of the semester): fundamentals and techniques of beekeeping, resource utilisation, behaviour experiments, pollinator diversity and plant-pollinator-interactions. 2. Ecology and taxonomy of insects (block, 2 weeks): observation and recording in the habitat, identification and characteristics of different arthropod groups, field experiments. 3. Ecological modelling (block, 2 weeks): current methods of ecological processes modelling, simulation models, the students' own modelling project on current issues in ecology. 4. Agroecology (block, 1 week): insect communities in agroecosystems, biological pest control in landscape context, evaluation of agri-environment schemes. 5. Forest ecology (block, 1 week): arthropod communities in forest ecosystems, methods of detection, influence of management on diversity patterns and functional groups. 6. Tropical ecology (block): small projects ecological or nature conservation-related issues to be implemented in a tropical ecosystem in East Africa. In the seminar, recent scientific publications on the topics covered in the modules listed above will be presented and discussed.

Intended learning outcomes

Students will have expanded their knowledge on ecological theories and current research issues in animal ecology. They will be able to design, perform, statistically analyse and interpret scientific research. They will be familiar with animal ecological methods and possible sources of error in data interpretation. They will have deepened their knowledge of the biology and ecology of important functional taxa of arthropods. Students will have acquired the knowledge and skills necessary to perform scientific activities in the context of an F2 practical course or a Master's thesis.

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

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

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

Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in
Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Animal Ecology and Tropical Biology F2 (Practical Course and Seminar 2)			07-MS1TÖF2-102-m01
Module coordinator		**Module offered by**	
holder of the Chair of Animal Ecology and Tropical Biology		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
15	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	Admission prerequisite to assessment: regular attendance of lab course and successful completion of the respective exercises as specified at the beginning of the course.	

Contents

In the F2 practical course, students will explore a scientific question as independently as possible. They will develop hypotheses, prepare a work schedule, collect data, perform experiments in the field, greenhouse or laboratory and will statistically analyse data. Students will document the results of their work in a log similar to a short scientific paper, including an introduction, material and methods, findings and a discussion of these. Students will also be required to present their findings during a wrap-up seminar. The various research groups at the Chair of Animal Ecology and Tropical Biology offer a wide variety of opportunities for students to complete an F2 practical course in Germany, another country in Europe or in the tropics. F2 practical courses may be completed in the context of an ongoing research project of the Institute or in cooperation with other institutions. For more detailed information on the F2 practical course as well as current topics or appointments for consultations, please refer to WueCampus, check out the notice board of the Chair or contact the research groups directly.

Intended learning outcomes

Students have gained knowledge on experimental setups and methods used in the fields of animal ecology and tropical ecology. They are qualified to design scientific research and are able to collect data and interpret them statistically. They have developed knowledge and skills that allow them to set up a scientific project for their Master's thesis.

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

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

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

Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Behavioral Biology (Practical Course and Seminar 1)			07-MS1VF1-102-m01
Module coordinator		**Module offered by**	
holder of the Chair of Behavioral Physiology and Sociobiology		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	Admission prerequisite to assessment: regular attendance of lab course as well as successful completion of the respective exercises.	

Contents

Students will be integrated into one of the research groups at the Chair and will independently work on one of the current topics in the field of behavioural physiology and sociobiology. They will gain an insight into the latest physiological, neurobiological and behavioural methods. The results obtained will be graphically and statistically analysed, summarised in a scientific report and presented in a talk. Please contact the research groups at the Chair for available topics and opportunities.

Intended learning outcomes

The students are able to independently perform scientific experiments in the field of behavioural physiology and sociobiology. In addition, they are able to process and document the results obtained and to present them to a scientific audience.

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

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

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

Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Behavioral Biology (Practical Course and Seminar 2)			07-MS1VF2-102-m01
Module coordinator		**Module offered by**	
holder of the Chair of Behavioral Physiology and Sociobiology		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
15	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	Admission prerequisite to assessment: regular attendance of lab course as well as successful completion of the respective exercises.	

Contents

Students will be integrated into one of the research groups at the Chair and will independently work on one of the current topics in the field of behavioural physiology and sociobiology. They will learn to plan experimental series and to apply the latest physiological, neurobiological and behavioural methods. The results obtained will be graphically and statistically analysed, summarised in a scientific report and presented in a talk. Please contact the research groups at the Chair for available topics and opportunities.

Intended learning outcomes

The students are able to independently perform scientific experiments in the field of behavioural physiology and sociobiology. In addition, they have learned to interpret the results obtained, taking into account current literature, and to place them in the context of other research in the field.

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

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

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

Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title	Abbreviation
Molecular Biology (Lecture)	07-MS2-102-m01

Module coordinator	Module offered by
holder of the Chair of Microbiology, holder of the Chair of Bioinformatics, holder of the Chair of Cell Biology and Developmental Biology, Prof. Dr. M. Sauer	Faculty of Biology

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

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

Molecular biology of the eukaryotic and prokaryotic cell. The lecture is a joint activity of the Chairs of Cell- and Developmental Biology, Microbiology, Biophysics and Bioinformatics and deals with concepts of modern molecular biology from the point of view of these different disciplines. Participants are recommended to read the textbook "Essential Cell Biology". The section on cell biology (app. a quarter of the lecture) mainly discusses the eukaryotic cell and intends to elucidate the vast diversity in structure and function of molecules, organelles and cells in addition to fundamental principles of modern molecular cell biology. The bioinformatics section (app. a quarter of the lecture) contains a large amount of examples for applications which allow the investigation of the molecular biology of a cell with bioinformatic tools. We closely adhere to the contents of the book "Essential Cell Biology" and present many clear and useful examples for the application of our tools when working on the topics of the other three Chairs. Our vision: bioinformatics essentially is molecular biology based on computing technology (time consuming "wet" experiments can be planned more easily and thus bioinformatics saves precious time). The microbiological section (app. a quarter of the lecture) deals with fundamental molecular aspects of prokaryotic cells. Key aspects include the organisation of the bacterial genome, the transcription and translation machinery, mechanisms of regulation of gene expression, transport of small molecules and macromolecules, cell division and differentiation, bacterial motility and chemotaxis, signal transduction and bacterial communication mechanisms. Recommended reading: (a) Allgemeine Mikrobiologie (Fuchs) and (b) Biology of Microorganisms (Brock).

Intended learning outcomes

Master level knowledge about the molecular biology of the eukaryotic and prokaryotic cell.

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

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

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

Students will be informed about the method, length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) oral examination of one candidate each (30 to 60 minutes) or c) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in
Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title	Abbreviation
Molecular Biology B	07-MS2B-121-m01

Module coordinator	Module offered by
holder of the Chair of Microbiology, holder of the Chair of Bioinformatics, holder of the Chair of Cell Biology and Developmental Biology, Prof. Dr. M. Sauer	Faculty of Biology

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

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

Molecular biology of the eukaryotic and prokaryotic cell. The lecture is a joint activity of the Chairs of Cell- and Developmental Biology, Microbiology, Biophysics and Bioinformatics and deals with concepts of modern molecular biology from the point of view of these different disciplines. Participants are recommended to read the textbook "Essential Cell Biology". The section on cell biology (app. a quarter of the lecture) mainly discusses the eukaryotic cell and intends to elucidate the vast diversity in structure and function of molecules, organelles and cells in addition to fundamental principles of modern molecular cell biology. The bioinformatics section (app. a quarter of the lecture) contains a large amount of examples for applications which allow the investigation of the molecular biology of a cell with bioinformatic tools. We closely adhere to the contents of the book "Essential Cell Biology" and present many clear and useful examples for the application of our tools when working on the topics of the other three Chairs. Our vision: bioinformatics essentially is molecular biology based on computing technology (time consuming "wet" experiments can be planned more easily and thus bioinformatics saves precious time). The microbiological section (app. a quarter of the lecture) deals with fundamental molecular aspects of prokaryotic cells. Key aspects include the organisation of the bacterial genome, the transcription and translation machinery, mechanisms of regulation of gene expression, transport of small molecules and macromolecules, cell division and differentiation, bacterial motility and chemotaxis, signal transduction and bacterial communication mechanisms. Recommended reading: (a) Allgemeine Mikrobiologie (Fuchs) and (b) Biology of Microorganisms (Brock).

Intended learning outcomes

Master level knowledge about the molecular biology of the eukaryotic and prokaryotic cell.

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

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

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

a) written examination (30 to 60 minutes, including multiple choice questions) or b) oral examination of one candidate each (approx. 30 to 60 minutes) or c) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Bioinformatics (Lecture and Seminar)			07-MS2BI-102-m01
Module coordinator		**Module offered by**	
holder of the Chair of Bioinformatics		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	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)

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

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

Students will be informed about the method, length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) oral examination of one candidate each (30 to 60 minutes) or c) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biochemistry (2012)
Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)
Master's degree (1 major) Mathematics (2012)
Master's degree (1 major) Computational Mathematics (2012)

Module title			Abbreviation
Bioinformatics (Practical Course and Seminar 1)			07-MS2BIF1-102-m01
Module coordinator		**Module offered by**	
holder of the Chair of Bioinformatics		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Detailed insight into methods in bioinformatics; depending on the topic selected, fields covered include: genomics (sequence-, domain analysis and annotation), omics data analysis (NGS, transcriptomics, metabolomics, proteomics), topological and structural analysis of biological interactions including statistical methods, phylogenetic analysis, protein structure analysis. Results are documented in the form of a presentation, a publication or a term paper.

Intended learning outcomes

Students have gained knowledge on experimental setups and methods used in the field of bioinformatics. They are able to design experiments, collect data and interpret them statistically, adhering to the principles of good scientific practice.

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

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

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

Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)
Master's degree (1 major) Mathematics (2012)
Master's degree (1 major) Computational Mathematics (2012)

Module title			Abbreviation
Bioinformatics (Practical Course and Seminar 2)			07-MS2BIF2-102-m01
Module coordinator		**Module offered by**	
holder of the Chair of Bioinformatics		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
15	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	Admission prerequisite to assessment: regular attendance of lab course and successful completion of the respective exercises as specified at the beginning of the course.	

Contents

Advanced insight into methods in bioinformatics; depending on the topic selected, fields covered include: genomics (sequence-, domain analysis and annotation), omics data analysis (NGS, transcriptomics, metabolomics, proteomics), topological and structural analysis of biological interactions including statistical methods, phylogenetic analysis, protein structure analysis. The techniques applied are evaluated on the basis of the results obtained and are modified where necessary. Results are documented in the form of a presentation, a publication or a term paper.

Intended learning outcomes

Proficiency in one or more methods in bioinformatics that allows students to independently perform and organise a scientific project in the field of bioinformatics and to document the results obtained. Students are able to design a research project and are prepared for working on a scientific question for their thesis.

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

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

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

Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)
Master's degree (1 major) Mathematics (2012)
Master's degree (1 major) Computational Mathematics (2012)

Module title			Abbreviation
Biophysics and Molecular Biotechnology (Lecture and Seminar)			07-MS2BT-102-m01
Module coordinator		**Module offered by**	
holder of the Chair of Biotechnology and Biophysics		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

This lecture provides a broad overview of biophysical techniques and their applications. The first part of the lecture discusses fundamental aspects of thermodynamics, kinetics and molecular interactions. The course then moves on to discuss biophysical methods that facilitate the investigation of individual cells down to the level of single molecules. Focus is on electromanipulation and dielectric spectroscopy of cells, biomembranes, electrophysiology, ion channels, protein folding, single-molecule fluorescence methods and high-resolution as well as dynamic microscopy.

Intended learning outcomes

Students will have acquired a knowledge of fundamental biophysical methods and their applications that will enable them to independently review relevant literature. In addition, they will have become acquainted with - or, where necessary, will be able to independently acquaint themselves with - biophysical mechanisms.

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

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

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

Students will be informed about the method, length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) oral examination of one candidate each (30 to 60 minutes) or c) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes)

Allocation of places

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

Master's degree (1 major) Biochemistry (2012)
Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Biophysics and Molecular Biotechnology (Practical Course and Seminar 1)			07-MS2BTF1-102-m01
Module coordinator		**Module offered by**	
holder of the Chair of Biotechnology and Biophysics		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

This practical course provides students with an insight into different biotechnological and biophysical topics and methods. Under expert guidance, students will perform selected experiments on the following topics: cellular and molecular biotechnology, nano and microsystems biotechnology, biomaterials and biosensors, high-resolution fluorescence microscopy, fluorescence spectroscopy, analysis and electromanipulation of cells.

Intended learning outcomes

Students will have acquired a knowledge of fundamental biotechnological and biophysical methods and their applications that will enable them to independently review relevant literature. In addition, they will have become acquainted with - or, where necessary, will be able to independently acquaint themselves with - biophysical mechanisms. Students will have acquired practical experience performing experiments, using a variety of scientific tools. In the seminar, students will have acquired detailed theoretical knowledge on these experiments and will have delivered a short presentation (15 minutes) on one of the experiments they performed.

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

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

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

Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Biophysics and Molecular Biotechnology (Practical Course and Seminar 2)			07-MS2BTF2-102-m01
Module coordinator		**Module offered by**	
holder of the Chair of Biotechnology and Biophysics		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
15	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	Admission prerequisite to assessment: regular attendance of lab course and successful completion of the respective exercises as specified at the beginning of the course.	

Contents

This practical course provides students with an insight into different biotechnological and biophysical topics and is close to laboratory research. Under expert guidance, students will perform selected experiments on one of the following topics: cellular and molecular biotechnology, nano and microsystems biotechnology, biomaterials and biosensors, high-resolution fluorescence microscopy, fluorescence spectroscopy, analysis and electromanipulation of cells. Performing experiments under expert guidance, students will become acquainted with techniques and instruments. Over the duration of the course, students will then be required to work increasingly independently on current research topics. Work on current research topics will spark the students' interest in topics and will help them select a topic for their Bachelor's thesis.

Intended learning outcomes

Students will become acquainted with modern biophysical methods and their applications in biotechnology. They will be able to independently work on scientific problems, to independently study relevant literature and to develop a quantitative understanding of biophysical mechanisms. In the seminar, students will acquire further theoretical knowledge on experiments and will give short presentations on experiments performed.

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

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

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

Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Human Genetics (Lecture and Seminar)			07-MS2HG-102-m01
Module coordinator		**Module offered by**	
Managing Director of the Institute of Human Genetics		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
2 semester	graduate	--	

Contents

This module will discuss current topics in human genetics.

Intended learning outcomes

Students will have gained the ability to understand current issues in human genetics and to discuss these in depth.

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

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

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

Students will be informed about the method, length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) oral examination of one candidate each (30 to 60 minutes) or c) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Human Genetics (Practical Course and Seminar 1)			07-MS2HGF1-102-m01
Module coordinator		**Module offered by**	
Managing Director of the Institute of Human Genetics		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Practical course on a topic in human genetics. Students spend five weeks working on a small, well-defined scientific lab project and learn how to present their data. They learn to discuss their data in a seminar. The students learn to apply experimental procedures and methods of human genetics, to independently address scientific questions and to document their experimental work in an appropriate way.

Intended learning outcomes

Students are able to independently investigate a topic in human genetics as well as to document, interpret and discuss their results, adhering to the principles of good scientific practice.

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

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

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

Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Human Genetics (Practical Course and Seminar 2)			07-MS2HGF2-102-m01
Module coordinator		**Module offered by**	
Managing Director of the Institute of Human Genetics		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
15	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	Admission prerequisite to assessment: regular attendance of lab course and successful completion of the respective exercises as specified at the beginning of the course.	

Contents

Current problems in the field of human genetics will be addressed by critically reading and presenting original research papers. The participants will be involved in the development of a research plan and will learn to apply advanced techniques to answer a scientific question in human genetics. This practical course will have a duration of 12 weeks (three months).

Intended learning outcomes

Students are able to independently investigate a topic in human genetics as well as to document, interpret and discuss their results, adhering to the principles of good scientific practice.

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

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

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

Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Immunology 1 (Lecture and Seminar)			07-MS2IM1-102-m01
Module coordinator			**Module offered by**
Managing Director of the Institute of Virology and Immunobiology			Faculty of Biology
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Fundamental concepts of modern cellular and molecular immunology. More information is available at http://www.virologie.uni-wuerzburg.de/lehrveranstaltungen/vorlesungen_und_praktika/immunologie/immunologie_biologen_master/.

Intended learning outcomes

Students will gain knowledge about, and will be able to present and discuss basic concepts and methods in molecular and cellular immunology.

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

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

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

Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Immunology 2 (Lecture and Seminar)			07-MS2IM2-102-m01
Module coordinator		**Module offered by**	
Managing Director of the Institute of Virology and Immunobiology		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Recent progress in molecular and cellular immunology. Deeper insights into selected immunology chapters, such as autoimmunity and immunomodulation, development of the immune system, immunogenetics, evolution of the immune system, infection immunology, and more.

Intended learning outcomes

Students are able to understand current topics in immunology and to discuss these in detail.

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

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

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

Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Immunology (Practical Course and Seminar 1)			07-MS2IMF1-102-m01
Module coordinator		**Module offered by**	
Managing Director of the Institute of Virology and Immunobiology		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Students will complete a 2-week lab course at the Institute of Virology and Immunobiology during which they will become familiar with fundamental methods in cellular and molecular immunology. Afterwards, students will select a laboratory at the Institute or one of the participating institutions (e. g. clinics, Virchow Center, molecular infection immunology and others) and will spend three weeks working on a defined project. Results of the lab course and lab project will be documented in a log and will be presented at the end of the course.

Intended learning outcomes

The students learn to apply experimental procedures and methods in immunology, to independently address scientific questions and to appropriately document their experimental work.

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

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

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

Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Immunology (Practical Course and Seminar 2)			07-MS2IMF2-102-m01
Module coordinator		**Module offered by**	
Managing Director of the Institute of Virology and Immunobiology		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
15	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	Admission prerequisite to assessment: regular attendance of lab course and successful completion of the respective exercises as specified at the beginning of the course.	

Contents

Critically reading and presenting original research papers (in English language), participants will independently investigate current problems in immunology. They will be involved in the development of a research plan and will independently apply advanced techniques in cellular and/or molecular immunology.

Intended learning outcomes

The participants acquire skills allowing them to work independently in the field of cellular and molecular immunology. This includes competence to address immunological problems on their own and to conduct, document and interpret their research according to good research practice.

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

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

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

Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Microbiology 1 (Lecture and Seminar)			07-MS2M1-112-m01
Module coordinator		**Module offered by**	
holder of the Chair of Microbiology		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Fundamentals of molecular microbiology and infection biology, mechanisms of adherence and invasion, bacterial pathogenicity factors, regulation of virulence, mechanisms of host defence and pathogen interference, current methods in infection biology.

Intended learning outcomes

The students are able to understand fundamental theories of molecular microbiology and infection biology, emergence of infectious diseases.

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

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

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

Students will be informed about the method, length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) oral examination of one candidate each (30 to 60 minutes) or c) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes)

Allocation of places

Biology Master's: no restrictions. Biochemistry Master's: 15 places. Places will be allocated by lot.

Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biochemistry (2012)
Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Microbiology 2 (Lecture and Seminar)			07-MS2M2-112-m01
Module coordinator		**Module offered by**	
holder of the Chair of Microbiology		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Fundamental principles of the mode of action of microbial pathogenicity factors will be presented using selected prokaryotic and eukaryotic pathogens as model organisms. In addition, current research methods in infection biology will be presented.

Intended learning outcomes

Students have gained fundamental knowledge in infection biology and pathogenicity research and the mechanisms behind infectious diseases.

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

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

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

Students will be informed about the method, length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) oral examination of one candidate each (30 to 60 minutes) or c) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes)

Allocation of places

Biology Master's: no restrictions. Biochemistry Master's: 15 places. Places will be allocated by lot.

Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biochemistry (2012)
Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Microbiology (Practical Course and Seminar 1)			07-MS2MF1-102-m01
Module coordinator		**Module offered by**	
holder of the Chair of Microbiology		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Under guidance, participants will work on a current research project dealing with microbial pathogens and their interactions with the host. Participants will employ a variety of state-of-the-art methods within the fields of molecular biology, microbiology, cell biology, and immunology as well as data analysis and literature search techniques. Results will be documented and discussed in a seminar paper or an oral presentation.

Intended learning outcomes

Participants will acquire the skills to experimentally address scientific questions in molecular biology and infection biology, properly document experimental results and adhere to the standards of good scientific practice.

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

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

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

Students will be informed about the method, length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) oral examination of one candidate each (30 to 60 minutes) or c) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Microbiology (Practical Course and Seminar 2)			07-MS2MF2-102-m01
Module coordinator		**Module offered by**	
holder of the Chair of Microbiology		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
15	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	Admission prerequisite to assessment: regular attendance of lab course and successful completion of the respective exercises as specified at the beginning of the course.	

Contents

Participants will independently work on a current research project dealing with microbiology and infection biology. They will apply advanced experimental techniques in microbiology, cell biology and molecular biology according to the project requirements. Progress of the research project will be reported in a seminar paper, a research paper or an oral presentation.

Intended learning outcomes

The participants will acquire the skills to independently perform basic research on microbiology and infection biology according to the standards of good scientific practice and to properly document, interpret and present experimental results.

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

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

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

Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Physiological Chemistry (Practical Course and Seminar 2)			07-MS2PHF2-102-m01
Module coordinator		**Module offered by**	
holder of the Chair of Bioinformatics		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
15	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	Admission prerequisite to assessment: regular attendance of lab course and successful completion of the respective exercises as specified at the beginning of the course.	

Contents

Critically reading and presenting original research papers (in English language), participants will independently investigate current problems in physiological chemistry. They will be involved in the development of a research plan and will independently apply advanced techniques in molecular cell biology and/or developmental biochemistry.

Intended learning outcomes

Students are able to plan and design research in the fields of molecular cell biology and developmental biochemistry. They are able to work according to good scientific practice and to document, interpret and discuss their results.

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

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

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

Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Virology 1 (Lecture and Seminar)			07-MS2V1-102-m01
Module coordinator			**Module offered by**
Managing Director of the Institute of Virology and Immunobiology			Faculty of Biology
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

This course offers an introduction to virology and current research in the field of virology.

Intended learning outcomes

Students will have gained the ability to understand current issues in virology and to discuss these in depth.

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

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

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

Students will be informed about the method, length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) oral examination of one candidate each (30 to 60 minutes) or c) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Virology 2 (Lecture and Seminar)			07-MS2V2-102-m01
Module coordinator		**Module offered by**	
Managing Director of the Institute of Virology and Immunobiology		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

This course offers an introduction to virology and current research in the field of virology.

Intended learning outcomes

Students will have gained the ability to understand current issues in virology and to discuss these in depth.

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

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

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

Students will be informed about the method, length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) oral examination of one candidate each (30 to 60 minutes) or c) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Virology (Practical Course and Seminar 1)			07-MS2VF1-102-m01
Module coordinator		**Module offered by**	
Managing Director of the Institute of Virology and Immunobiology		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Current research topics in virology - one topic will be discussed in depth.

Intended learning outcomes

Students are able to perform small research projects in a virology lab. They are familiar with the rules of good scientific practice, work independently on a current case study and document their results.

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

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

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

Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Virology (Practical Course and Seminar 2)			07-MS2VF2-102-m01
Module coordinator		**Module offered by**	
Managing Director of the Institute of Virology and Immunobiology		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
15	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	Admission prerequisite to assessment: regular attendance of lab course and successful completion of the respective exercises as specified at the beginning of the course.	

Contents

Current research topics in virology - one topic will be discussed in depth.

Intended learning outcomes

Students are able to perform small research projects in a virology lab. They are familiar with the rules of good scientific practice, work independently on a current case study and document their results.

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

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

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

Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Cell- and Developmental Biology Master 1 (Lecture and Seminar 1)			07-MS2ZE1-102-m01
Module coordinator		**Module offered by**	
holder of the Chair of Cell Biology and Developmental Biology		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

The module consists of the lecture *Zellpathologie* (*Cytopathology*) and the seminar *Zellbiologie-Meilensteine und Perspektiven* (*Milestones and Perspectives of Cell Biology*). The lecture describes pathological states of the cell and unravels their biological causes and consequences, such as infection, apoptosis, senescence, metabolic disorders and cancer. In the seminar *Milestones and Perspectives of Cell Biology*, classic ground-breaking publications in the field of cell biology are discussed from an unusual point of view.

Intended learning outcomes

Participants possess scientific background knowledge on cytopathology and are able to put this into the broader context of cell biology research.

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

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

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

Students will be informed about the method, length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) oral examination of one candidate each (30 to 60 minutes) or c) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title	Abbreviation
Cell- and Developmental Biology Master 2 (Lecture and Seminar 2)	07-MS2ZE2-102-m01

Module coordinator	Module offered by
holder of the Chair of Cell Biology and Developmental Biology	Faculty of Biology

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

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

&& The module comprises the lecture *Signale und Differenzierung* (*Signals and Differentiation*) and the seminar *Entwicklungsbiologie-Meilensteine und Perspektiven* (*Milestones and Perspectives of Developmental Biology*). The lecture *Signale und Differenzierung* (*Signals and Differentiation*) is not designed to merely impart textbook knowledge to students. It will rather introduce students to particularly interesting and current topics in developmental biology. Topics covered in the lecture (subject to change): - Cooperation: Development and consequences of multicellularity. - Sex: More than just ? + ? =. - On the move: Morphogenetic migration. - All-rounders?: Opportunities and limitations of stem cell research. - Growing new hearts?: Animals and their ability to regenerate. - Disasters: What do we actually know about metamorphoses? - Always the same?: Plasticity and epigenetics. - Metaorganisms: We are never alone. - Development in changing environments: Ecology and polyphenism. - Developmental biology of behaviour: Everything is learned. Or isn't it? - Evo-devo: A fad? No, been around for ages. In the seminar *Entwicklungsbiologie-Meilensteine und Perspektiven* (*Developmental Biology - Milestones and Outlook*), classical ground-breaking scientific articles in the field of developmental biology will be discussed from an unusual point of view.

Intended learning outcomes

Participants possess a knowledge of the theoretical and molecular biological principles underlying developmental biology and are able to put this into the broader context of cell and developmental biology research.

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

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

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

Students will be informed about the method, length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) oral examination of one candidate each (30 to 60 minutes) or c) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Cell- and Developmental Biology Practical Course and Seminar 1			07-MS2ZEF1-102-m01
Module coordinator		**Module offered by**	
holder of the Chair of Cell Biology and Developmental Biology		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	Admission prerequisite to assessment: regular attendance of lab course and successful completion of the respective exercises as specified at the beginning of the course.	

Contents

This 5 week full-time practical course provides an introduction to modern cell and developmental biology-related methods with a focus on bio-imaging techniques. A broad variety of model organisms is covered and the participants are encouraged to independently design and perform their own experiments. Participants use their acquired technological skills to analyse important basic biological processes. In addition, the importance of cell and developmental biology for medicine and the economy is highlighted. During the fifth and final week of the course, students acquire sustained insights into current research activities of the Chair and, interacting with Master's students, doctoral researchers and post-docs, gain first-hand experience of research activities.

Intended learning outcomes

The participants are able to approach complex scientific questions in the fields of cell and developmental biology and to independently implement acquired methodological tools to answer these questions. They are able to perform and document cell and developmental biology-related experiments, adhering to a generally accepted code of scientific practice.

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

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

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

Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Cell- and Developmental Biology Practical Course and Seminar 2			07-MS2ZEF2-102-m01
Module coordinator		**Module offered by**	
holder of the Chair of Cell Biology and Developmental Biology		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
15	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	Admission prerequisite to assessment: regular attendance of lab course and successful completion of the respective exercises as specified at the beginning of the course.	

Contents

Well-defined aspects of scientific projects are addressed with independently designed experiments in the context of current research projects in the field of cell and developmental biology. The techniques applied are evaluated on the basis of the results obtained and modified where necessary. The results of all experiments as well as the impact on the research project are presented and discussed in a progress report seminar within the team.

Intended learning outcomes

The participants are able to independently carry out scientific experiments in the fields of cell and developmental biology and to modify them according to the outcome. They are able to independently approach current scientific topics and to perform, interpret and document experiments, adhering to accepted rules of scientific practice.

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

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

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

Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Cellular Tumorbiology Master 1 (Practical Course and Seminar 1)			07-MS2ZTF1-112-m01
Module coordinator		**Module offered by**	
degree programme coordinator Biologie (Biology)		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	Admission prerequisite to assessment: regular attendance of lab course and successful completion of the respective exercises as specified at the beginning of the course.	

Contents

Under guidance, participants will work on a current topic in tumour biology. Topics will focus in particular on current problems in oncolytic virotherapy. Participants will become familiar with a variety of methods within the fields of molecular biology, infection biology and cell biology as well as literature search techniques. They will employ a broad range of methods in cell biology, infection biology and immunology. Results will be documented in the form of a presentation, a publication or a term paper.

Intended learning outcomes

Students are able to investigate scientific questions in molecular biology and cell biology and to document their work, adhering to the principles of good scientific practice.

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

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

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

Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Cellular Tumorbiology Master 2 (Practical Course and Seminar 2)			07-MS2ZTF2-112-m01
Module coordinator		**Module offered by**	
degree programme coordinator Biologie (Biology)		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
15	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	Admission prerequisite to assessment: regular attendance of lab course and successful completion of the respective exercises as specified at the beginning of the course.	

Contents

Students will be involved in current research projects in tumour biology. Aspects of the scientific question will be independently addressed by the students. They will apply experimental techniques in cell biology, immunology and/or molecular biology. The techniques applied will be evaluated on the basis of the results obtained and modified where necessary. Experimental results and progress in the research project will be documented in the form of a presentation, a publication or a term paper.

Intended learning outcomes

Students are able to independently carry out scientific experiments on a topic in tumour biology/oncology. They are able to answer and discuss questions in the field of tumour biology/oncology. Students are able to adhere to the principles of good scientific practice and to document, interpret and discuss their results. They are able to apply specific techniques required to answer scientific questions.

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

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

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

Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Current Methods in Plant Biology (Lecture)			07-MS3-112-m01
Module coordinator		**Module offered by**	
holder of the Chair of Plant Physiology and Biophysics		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

This lecture addresses topics of pathogen recognition and signal transduction in plants, molecular and organismic defence and the pharmaceutical relevance of plant-derived bioactive compounds. Plant immunobiology: interactions between plants and pathogens comprise evolutionary dynamic and complex systems. Different strategies of the pathogens - bacteria, fungi and viruses - as well as defence mechanisms of the host plants will be discussed. The molecular mechanisms of pathogen recognition, signal transduction, regulation of gene expression and activation of local and systemic defence responses are in the focus of this lecture. Differences and similarities between plant and human immune systems will be pointed out. Understanding plant-pathogen-interactions and molecular mechanisms determining susceptibility and defence is fundamental for the development of strategies in plant protection. Evolution, function and pharmaceutical relevance of plant secondary metabolites: Secondary metabolites are part of effective plant defence strategies against microorganisms and herbivores and are often essential for survival. The evolution of secondary metabolism will be discussed and general as well as specific defence strategies will be explained. Pharmacological mechanisms of action and molecular targets of important classes of plant bioactive compounds will be presented. A high proportion of currently used drugs have been developed from plant secondary metabolites that have been used as lead structures to generate potent drugs with improved pharmaceutical properties. Examples of therapies with very potent plant pharmaceuticals (evidence-based medicine) as well as possibilities and limitations of phytotherapy (traditional medicine) will be discussed.

Intended learning outcomes

The students are qualified to perform and organize their scientific laboratory work independently and document the obtained results. They are able to design a research project and are prepared to work on a scientific question for their thesis.

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

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

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

Students will be informed about the method, length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) oral examination of one candidate each (30 to 60 minutes) or c) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in
Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)
Master's degree (1 major) FOKUS Pharmacy (2012)

Module title			Abbreviation
Current Methods in Plant Biology B			07-MS3B-121-m01
Module coordinator		**Module offered by**	
holder of the Chair of Plant Physiology and Biophysics		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
7	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

This lecture addresses topics of pathogen recognition and signal transduction in plants, molecular and organismic defence and the pharmaceutical relevance of plant-derived bioactive compounds. Plant immunobiology: interactions between plants and pathogens comprise evolutionary dynamic and complex systems. Different strategies of the pathogens - bacteria, fungi and viruses - as well as defence mechanisms of the host plants will be discussed. The molecular mechanisms of pathogen recognition, signal transduction, regulation of gene expression and activation of local and systemic defence responses are in the focus of this lecture. Differences and similarities between plant and human immune systems will be pointed out. Understanding plant-pathogen-interactions and molecular mechanisms determining susceptibility and defence is fundamental for the development of strategies in plant protection. Evolution, function and pharmaceutical relevance of plant secondary metabolites: Secondary metabolites are part of effective plant defence strategies against microorganisms and herbivores and are often essential for survival. The evolution of secondary metabolism will be discussed and general as well as specific defence strategies will be explained. Pharmacological mechanisms of action and molecular targets of important classes of plant bioactive compounds will be presented. A high proportion of currently used drugs have been developed from plant secondary metabolites that have been used as lead structures to generate potent drugs with improved pharmaceutical properties. Examples of therapies with very potent plant pharmaceuticals (evidence-based medicine) as well as possibilities and limitations of phytotherapy (traditional medicine) will be discussed.

Intended learning outcomes

The students are qualified to perform and organize their scientific laboratory work independently and document the obtained results. They are able to design a research project and are prepared to work on a scientific question for their thesis.

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

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

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

a) written examination (30 to 60 minutes, including multiple choice questions) or b) oral examination of one candidate each (approx. 30 to 60 minutes) or c) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Response towards Biotic and Abiotic Factors			07-MS3BA-102-m01
Module coordinator		**Module offered by**	
holder of the Chair of Pharmaceutical Biology		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

In their natural environment, plants are constantly exposed to a variety of biotic and abiotic (stress) factors. Plant responses to these external factors lead to changes in the regulation of gene expression, the activity of enzymes and the levels of a variety of metabolites. Some of these responses lead to increased stress resistance/tolerance. The lecture and seminar will not only discuss these plant responses and the mechanisms of perception and signal transduction. They will also examine the strategies of microorganisms and herbivores for using plants as a source of nutrients.

Intended learning outcomes

Students are able to understand the interaction between plants and the environment on a molecular level and to discuss the topic in the context of the scientific state of the art.

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

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

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

Students will be informed about the method, length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) oral examination of one candidate each (30 to 60 minutes) or c) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Biophysics and Biochemistry			07-MS3BB-102-m01
Module coordinator		**Module offered by**	
holder of the Chair of Plant Physiology and Biophysics		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

The module imparts theoretical and methodological knowledge of plant membrane transport, structural biology and biochemistry which is illustrated with specific examples from current research. Depending on the number of participants and their interests, practical demonstrations of methods that are currently used give students an opportunity to experience the practical aspects of biophysical and biochemical research.

Intended learning outcomes

Students are able to use methods dealing with soluble proteins or membrane proteins in the fields of biophysics, structural biology and biochemistry. They are able to interpret the data and to discuss the results within the context of current knowledge.

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

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

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

Students will be informed about the method, length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) oral examination of one candidate each (30 to 60 minutes) or c) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title	Abbreviation
Biophysics of Membraneproteins of Plants (Practical Course and Seminar 1)	07-MS3BPF1-102-m01

Module coordinator	Module offered by
Prof. Dr. I. Marten, holder of the Chair of Plant Physiology and Biophysics	Faculty of Biology

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

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

The module provides an in-depth insight into biophysical strategies and methods which are used for the functional characterisation of plant membrane proteins. The students will be integrated into research projects on current topics in molecular plant membrane biology.

Intended learning outcomes

The students have knowledge of general biophysical strategies and methods with a focus on plant membrane proteins, they are able to independently work on related scientific issues and to document the results obtained.

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

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

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

Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Biochemistry and Structural Biology (Practical Course and Seminar 1)			07-MS3BSF1-102-m01
Module coordinator		**Module offered by**	
holder of the Chair of Plant Physiology and Biophysics		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

The module provides an in-depth insight into strategies and methods of protein biochemistry and structural biology.

Intended learning outcomes

The students have knowledge about general strategies and methods of protein biochemistry and structural biology with a focus on membrane proteins. They are able to perform and organise their scientific laboratory work independently and document the results obtained.

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

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

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

Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Biochemistry and Structural Biology (Practical Course and Seminar 2)			07-MS3BSF2-102-m01
Module coordinator		**Module offered by**	
holder of the Chair of Plant Physiology and Biophysics		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
15	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	Admission prerequisite to assessment: regular attendance of lab course and successful completion of the respective exercises as specified at the beginning of the course.	

Contents

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

Intended learning outcomes

The students are able to independently perform and organise their scientific laboratory work in the fields of biochemistry and structural biology and to document the results obtained. They are able to design a research project and are prepared for working on a scientific question for their thesis.

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

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

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

Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Microbial and Chemical Ecology (Practical Course and Seminar 1)			07-MS3MCÖF1-102-m01
Module coordinator		**Module offered by**	
holder of the Chair of Pharmaceutical Biology		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Under guidance, students will investigate a current topic in microbial and chemical ecology, e. g. mutualistic, commensal or pathogenic interactions between animal and plant hosts and microorganisms. Students will become familiar with a variety of methods within the fields of molecular ecology, microbial ecology and analytical chemistry as well as literature search techniques. They will document and discuss the results of their work in a presentation, publication or term paper.

Intended learning outcomes

Students have gained knowledge on experimental setups and methods used in the field of chemical ecology. They are able to design scientific research, to collect data and to interpret them statistically, adhering to the principles of good scientific practice.

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

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

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

Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Microbial and Chemical Ecology (Practical Course and Seminar 2)			07-MS3MCÖF2-102-m01
Module coordinator		**Module offered by**	
holder of the Chair of Pharmaceutical Biology		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
15	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	Admission prerequisite to assessment: regular attendance of lab course as well as successful completion of the respective exercises.	

Contents

With the help of literature published in English language, students will independently acquaint themselves with topics in contemporary research on microbial and chemical ecology. They will be involved in the development of a research plan and will apply advanced

Intended learning outcomes

Students are able to scientifically work on a topic in chemical ecology. They are able to answer and to discuss questions asked in the field of chemical ecology. They are able to work according to good practice and to document, interpret and to discuss their results. They have developed the ability to apply specific techniques required to answer scientific questions.

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

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

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

Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Molecular Biology of Plants (Practical Course and Seminar 1)			07-MS3MF1-102-m01
Module coordinator		**Module offered by**	
holder of the Chair of Plant Physiology and Biophysics		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

The module provides an in-depth insight into molecular biological strategies and methods applied in plant physiology.

Intended learning outcomes

The students have knowledge about basic molecular biological strategies and methods focusing on plant physiology. They are able to perform and organise their scientific laboratory work independently and document the results obtained.

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

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

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

Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Developmental Physiology and Adaption of Plants (Lecture and Seminar)			07-MS3PA-102-m01
Module coordinator		**Module offered by**	
holder of the Chair of Pharmaceutical Biology		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Section Developmental Physiology: The lecture will discuss the physiological processes occurring during ontogeny as well as the reaction of plants to various environmental parameters. It will focus on introducing students to the molecular components (ABA, auxin, ethylene etc.) of signalling networks and explaining their biosynthesis, regulation and functioning. Current journal articles on the topics will be presented and discussed in the seminar. Section Adaptation: The lecture will deal with the ecological and environmental constraints under which plants grow and develop (biogeography, biodiversity) and with the interactions of plants with abiotic and biotic environmental factors (e. g. plant-insect, plant-fungus interactions). The evolutionary adaptations on the physiological and organismic level will be emphasised in particular (stress and defence reactions, carnivory, plant protection). Based on selected examples from current research, the seminar will address the topics covered in the lecture in more detail. It will be complemented by topic-related guided tours in the Botanical Garden of the University of Würzburg.

Intended learning outcomes

Students are qualified to recognise ecological and physiological relations and are able to interpret and discuss these relations in the context of the current state of knowledge.

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

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

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

Students will be informed about the method, length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) oral examination of one candidate each (30 to 60 minutes) or c) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Pharmaceutical Biology (Practical Course and Seminar 1)			07-MS3PBF1-102-m01
Module coordinator		**Module offered by**	
holder of the Chair of Pharmaceutical Biology		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

All organisms are able to reprogram their metabolism in response to various endogenous or exogenous perturbations. Reprogramming of metabolism is often correlated to phenotypic changes e. g. in disease development, physiology or behaviour. At the Chair of Pharmaceutical Biology, we apply metabolomics for gene function- or stress response analysis. Students can choose a topic from the variety of ongoing projects. Depending on the scientific question addressed by the research team at the Chair, the methodological approach involves techniques in the field of metabolomics/bioanalytics and/or molecular biology. In this module, students will be trained to use quantitative metabolite analysis methods (chromatography, mass spectrometry) and apply advanced molecular biology techniques. Depending on the project, different model organisms are studied. Prior knowledge in metabolite analysis or mass spectrometry is not required. Current scientific questions in the life sciences form the basis to impart scientific concepts and to train students in the laboratory. The module involves the experimental design, realisation and critical evaluation of scientific experiments as well as the documentation and presentation of the progress. More information is available on request or can be found at http://www.pbio.biozentrum.uni-wuerzburg.de/.

Intended learning outcomes

Students will be trained in using specific molecular biology methods and/or metabolomics approaches to address scientific questions, in the documentation of experimental procedures and results, and in the interpretation of data.

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

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

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

Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Master's degree (1 major) FOKUS Pharmacy (2012)

Module title			Abbreviation
Pharmaceutical Biology (Practical Course and Seminar 2)			07-MS3PBF2-102-m01
Module coordinator		**Module offered by**	
holder of the Chair of Pharmaceutical Biology		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
15	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	Admission prerequisite to assessment: regular attendance of lab course as well as successful completion of the respective exercises.	

Contents

Students will be involved in current research projects in pharmaceutical biology or in collaborative research projects that focus on the regulation of metabolism and analysis of metabolic pathways (e. g. in the context of reactions towards biotic or abiotic stress, functional and phenotypic analysis of mutants, or drug metabolism). Aspects of the scientific question will be independently addressed by the students. Molecular biology methods and/or metabolomic approaches will be optimised for and adapted to the specific problem. Experimental results and progress in the understanding of biological problems will be documented in the form of a log and presented in a seminar. More information is available on request or can be found at http://www.pbio.biozentrum.uni-wuerzburg.de/.

Intended learning outcomes

The participants are able to independently carry out scientific experiments and to modify them according to the outcome. They are able to independently approach scientific topics in pharmaceutical biology and to perform, interpret and document experiments, adhering to accepted rules of scientific practice. They are able to apply specific techniques required to answer scientific questions.

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

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

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

Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Specific Ecology and Ecophysiology of Plants (Practical Course and Seminar 1)			07-MS3PÖF1-102-m01
Module coordinator		**Module offered by**	
holder of the Chair of Ecophysiology and Vegetation Ecology		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Under guidance, students will investigate a current problem in ecology/ecophysiology (e. g. plant-insect and plant-fungus interactions, biogeography, characterisation of plant surfaces, cuticular barrier properties). Working concepts and complex experiments will be designed, and the results will be documented and presented in the form of presentations, publications or logs. Students will be involved in ongoing research and will consolidate their skills in the application of advanced methods in ecophysiology, analytical chemistry or molecular biology.

Intended learning outcomes

Students have gained knowledge on experimental setups and methods used in the field of plant ecophysiology. They are able to design scientific research, to collect data and to interpret them statistically, adhering to the principles of good scientific practice.

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

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

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

Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Specific Ecology and Ecophysiology of Plants (Practical Course and Seminar 2)			07-MS3PÖF2-102-m01
Module coordinator		**Module offered by**	
holder of the Chair of Ecophysiology and Vegetation Ecology		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
15	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	Admission prerequisite to assessment: regular attendance of lab course and successful completion of the respective exercises as specified at the beginning of the course.	

Contents

Students will work on projects taken from ongoing research in plant ecology and ecophysiology (e. g. plant-insect-, plant-fungus interactions; biogeography; characterisation of plant surfaces, cuticular barrier properties). They will do this work to a large extent on their own responsibility. Based on the results obtained, the ecophysiological, analytical, molecular biological and/or microbiological methods applied (e. g. measurement of transpiration, chromatography, mass spectrometry, fluorescence microscopy, PCR, cloning strategies) will be critically assessed and, where necessary, modified. Students will document and discuss the progress of their work and of the project as a whole in the form of a presentation, a publication or a term paper.

Intended learning outcomes

Students are able to scientifically work on a topic in plant ecophysiology. They are able to answer and to discuss questions asked in the field of chemical ecology. They are able to work according to good practice and to document, interpret and to discuss their results. They have developed the ability to apply specific techniques required to answer scientific questions.

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

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

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

Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
System Biology (Lecture and Seminar)			07-MS3S-102-m01
Module coordinator		**Module offered by**	
holder of the Chair of Bioinformatics		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Advances and current results of computational systems biology are explained and discussed, this includes results from functional genomics, dynamics of the transcriptome, of metabolism and metabolic networks as well as regulatory networks.

Intended learning outcomes

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

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

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

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

Students will be informed about the method, length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) oral examination of one candidate each (30 to 60 minutes) or c) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)
Master's degree (1 major) Mathematics (2012)
Master's degree (1 major) Computational Mathematics (2012)

Module title			Abbreviation
System Biology (Practical Course and Seminar 1)			07-MS3SYF1-102-m01
Module coordinator		**Module offered by**	
holder of the Chair of Bioinformatics		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

The practical course will provide students with advanced insights into a field of systems biology and will, in particular, make students proficient in a dynamical method in systems biology (areas that may be selected include protein structure analysis and protein folding, genome analysis and evolution; dynamic network analysis, the dynamics of protein-protein interactions, modelling cellular regulation; modelling metabolism, statistical modelling).

Intended learning outcomes

Students have gained knowledge on experimental setups and methods used in the field of systems biology. They are able to design scientific research, to collect data and to interpret them statistically, adhering to the principles of good scientific practice.

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

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

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

Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)
Master's degree (1 major) Mathematics (2012)
Master's degree (1 major) Computational Mathematics (2012)

Module title			Abbreviation
System Biology (Practical Course and Seminar 2)			07-MS3SYF2-102-m01
Module coordinator		**Module offered by**	
holder of the Chair of Bioinformatics		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
15	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	Admission prerequisite to assessment: regular attendance of lab course and successful completion of the respective exercises as specified at the beginning of the course.	

Contents

The practical course will provide students with advanced insights into a field of systems biology and will, in particular, make students proficient in a dynamical method in systems biology (areas that may be selected include protein structure analysis and protein folding, genome analysis and evolution; dynamic network analysis, the dynamics of protein-protein interactions, modelling cellular regulation; modelling metabolism, statistical modelling). The techniques applied are evaluated on the basis of the results obtained and are modified where necessary. Results are documented in the form of a presentation, a publication or a term paper.

Intended learning outcomes

Proficiency in one or more methods in systems biology that allows students to independently perform and organise a scientific project in the field of bioinformatics and to document the results obtained. Students are able to design a research project and are prepared for working on a scientific question for their thesis.

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

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

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

Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)
Master's degree (1 major) Mathematics (2012)
Master's degree (1 major) Computational Mathematics (2012)

Module title			Abbreviation
Specific Molecular-, Cell- and Developmental Biology of Plants (Practical Course and Seminar 1)			07-MS3ZE-102-m01
Module coordinator		**Module offered by**	
holder of the Chair of Plant Physiology and Biophysics		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
15	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	Admission prerequisite to assessment: regular attendance of lab course and successful completion of the respective exercises as specified at the beginning of the course.	

Contents

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

Intended learning outcomes

Students are able to work on a scientific question, to design an experimental setup as well as to interpret, document and present their results.

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

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

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

Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Practical Course as exchange student 1			07-MSA1-102-m01
Module coordinator		**Module offered by**	
Coordinator BioCareers		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	Please consult with course advisory service in advance.	

Contents

Practical course during stay abroad on a selected topic in biology (duration: 2-3 weeks).

Intended learning outcomes

Proficiency in selected methods and lab techniques from selected fields of biology. Ability to apply these methods and techniques later on in a research project.

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

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

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

Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Practical Course as exchange student 2			07-MSA2-102-m01
Module coordinator		**Module offered by**	
Coordinator BioCareers		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	Please consult with course advisory service in advance.	

Contents

External placement on a biological topic. Students spend 4-6 weeks working on a well-defined scientific project and learn how to present their data.

Intended learning outcomes

Proficiency in selected methods and lab techniques from selected fields of biology. Ability to apply these methods and techniques later on in a research project.

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

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

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

Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Practical Course as exchange student 3			07-MSA3-102-m01
Module coordinator		**Module offered by**	
Coordinator BioCareers		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
15	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	Please consult with course advisory service in advance.	

Contents

External placement on a biological topic. Students spend 6-9 weeks working on a well-defined scientific lab project and learn how to present their data.

Intended learning outcomes

Proficiency in selected methods and lab techniques from selected fields of biology. Ability to apply these methods and techniques later on in a research project.

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

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

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

Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Systems Biology B			07-MS-B-121-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	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Advances and current results of computational systems biology are explained and discussed, this includes results from functional genomics, dynamics of the transcriptome, of metabolism and metabolic networks as well as regulatory networks.

Intended learning outcomes

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

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

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

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

Students will be informed about the method, length and scope of the assessment prior to the course. a) written examination (30 to 60 minutes, including multiple choice questions) or b) oral examination of one candidate each (30 to 60 minutes) or c) oral examination in groups of up to 3 candidates (30 to 60 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)
Master's degree (1 major) Mathematics (2012)
Master's degree (1 major) Biomedicine (2013)
Master's degree (1 major) Biomedicine (2012)
Master's degree (1 major) Computational Mathematics (2012)

Module title			Abbreviation
Biochemistry, Physiology and Genetics of Mammalian Cell Culture			07-MSCC-111-m01
Module coordinator		**Module offered by**	
degree programme coordinator Biologie (Biology)		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Introduction to cell culture, cell culture lab equipment, cellular biochemistry and cell structures, cell proliferation, generation of in vitro cell models and their applications, cell culture formats, fundamental cell analytical technologies.

Intended learning outcomes

Students are able to understand the biochemistry, physiology and genetics of mammalian cell culture, and are able to use these techniques.

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

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

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

a) written examination (usually 30 to 60 minutes, including multiple choice questions) or b) log (usually approx. 10 to 30 pages) or c) oral examination of one candidate each (usually 30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (usually approx. 30 to 60 minutes) or e) presentation (usually 20 to 45 minutes)
Language of assessment: English

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)
Master's degree (1 major) FOKUS Life Sciences (2012)

Module title			Abbreviation
Seminar Experimental Animal Ecology			07-MSET-121-m01
Module coordinator		**Module offered by**	
holder of the Chair of Animal Ecology and Tropical Biology		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
2	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Introduction to and discussion of current research in: Honigbienen- und Wildbienenökologie (Ecology of Wild Bees and Honeybees, 07-MHWB), Ökologie und Taxonomie der Insekten (Ecology and Taxonomy of Insects, 07-METI), Modellierung in der Ökologie (Ecological Modelling, 07-MMIE), Agrarökologie (Agroecology, 07-MAGRE), Waldökologie (Forest Ecology, 07-MFEC), Tropenökologie (Tropical Ecology, 07-MTROP).

Intended learning outcomes

Students have acquired in-depth knowledge about current research in experimental animal ecology and are able to communicate and critically analyse methods and results of scientific publications.

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

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

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

a) written examination (approx. 30 to 60 minutes, including multiple choice questions) or b) log (10 to 30 pages) or c) oral examination of one candidate each (approx. 30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (approx. 20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Laboratory practical course 1			07-MSL1-102-m01
Module coordinator		**Module offered by**	
Coordinator BioCareers		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	Please consult with course advisory service in advance.	

Contents

Practical course, summer school or workshop on specific topics in biology (duration: 2-3 weeks).

Intended learning outcomes

Proficiency in specific methods and lab techniques from selected fields of biology. Ability to apply these methods and techniques later on in a research project.

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

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

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

Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Laboratory practical course 2			07-MSL2-102-m01
Module coordinator		**Module offered by**	
Coordinator BioCareers		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
10	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	Please consult with course advisory service in advance.	

Contents

Practical course, summer school or workshop on specific topics in biology (duration: 4-6 weeks).

Intended learning outcomes

Proficiency in specific methods and lab techniques from selected fields of biology. Ability to apply these methods and techniques later on in a research project.

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

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

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

Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Laboratory practical course 3			07-MSL3-102-m01
Module coordinator		**Module offered by**	
Coordinator BioCareers		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
15	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	Please consult with course advisory service in advance.	

Contents

Practical course, summer school or workshop on specific topics in biology (duration: 6-9 weeks).

Intended learning outcomes

Proficiency in specific methods and lab techniques from selected fields of biology. Ability to apply these methods and techniques later on in a research project.

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

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

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

Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Final Examination in Biology			07-MT-102-m01
Module coordinator		**Module offered by**	
chairperson of examination committee Biologie (Biology)		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
30	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	By way of exception, additional prerequisites are listed in the section on assessments.	

Contents

Applying adequate techniques, students address a defined scientific question. They plan and perform experiments to solve problems or summarise and interpret existing data. Students have to develop a research plan and apply advanced and novel techniques in the context of a given research project, adhering to the principles of good scientific practice. The results are summarised in a written thesis and defended in a colloquium. The project is to be completed within a time frame of six months.

Intended learning outcomes

Students are able to independently carry out scientific experiments and to modify them according to the outcome. They are able to independently approach current scientific topics and to perform, interpret and document experiments, adhering to accepted rules of scientific practice. Students are able to discuss and defend their work in the scientific community, drawing on their knowledge of similar or related topics.

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

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

- 07-MT-1-102: no courses assigned
- 07-MK-1-102: no courses assigned

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

Assessment in this module comprises the assessments in the individual module components as specified below. Unless stated otherwise, successful completion of the module will require successful completion of all individual assessments.

Assessment in module component 07-MT-1-102: Thesis

- 25 ECTS, Method of grading: numerical grade
- written thesis
- Language of assessment: German or English
- Other prerequisites: F2 lab course on topic of thesis

Assessment in module component 07-MK-1-102: Final Colloquium Biology

- 5 ECTS, Method of grading: numerical grade
- final colloquium (approx. 45 minutes)
- Only after successful completion of module components: 07-MT-1

Allocation of places

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Additional information

Additional information will be listed separately for each module component.

- 07-MT-1-102: Additional information on module duration: 6 months.
- 07-MK-1-102: --

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
Master's degree (1 major) Biology (2011) Master's degree (1 major) Biology (2010) Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Animal Ecology and Tropical Biology 2 B			07-MTÖ2B-121-m01
Module coordinator		**Module offered by**	
holder of the Chair of Animal Ecology and Tropical Biology		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

This module provides the fundamentals of the biology of tropical habitats and tropical communities. A special focus is on the global significance of tropical systems (ecosystem goods and ecosystem services), but the biological features of these highly diverse biomes are also highlighted.

Intended learning outcomes

The students will acquire deep knowledge of ecological theories and up-to-date research issues in the field of tropical ecology. They will be qualified to interpret scientific work and apply the knowledge they have acquired to the solution of current environmental risks.

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

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

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

a) written examination (30 to 60 minutes, including multiple choice questions) or b) oral examination of one candidate each (approx. 30 to 60 minutes) or c) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Animal Ecology and Tropical Biology			07-MTÖB-121-m01
Module coordinator		**Module offered by**	
holder of the Chair of Animal Ecology and Tropical Biology		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

This module consists of a lecture and a seminar. The lecture gives an overview of the theoretical foundations and current issues in animal ecology. Focus will be on biodiversity and ecosystem functions, multi-trophic interactions and food nets, evolutionary ecology, chemical ecology, tropical ecology, agricultural ecology, and global change.

Intended learning outcomes

The students will acquire an advanced knowledge of ecological theories and current research issues in the field of animal ecology. They will be able to interpret scientific publications and apply the acquired knowledge to the solution of current environmental risks.

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

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

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

a) written examination (30 to 60 minutes, including multiple choice questions) or b) oral examination of one candidate each (approx. 30 to 60 minutes) or c) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Tropical Ecology			07-MTROP-121-m01
Module coordinator		**Module offered by**	
holder of the Chair of Animal Ecology and Tropical Biology		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Small projects on ecological or nature conservation-related issues will be implemented in a tropical ecosystem. Students should become familiar with different project stages from experiment design, implementation and data analysis through to data presentation. In evening seminars, recent publications in the field of tropical ecology will be presented and discussed.

Intended learning outcomes

The students will learn about various tropical ecosystems and will acquire advanced knowledge of ecological and nature conservation-related research in the tropics. They will learn field ecological methods for the quantitative detection of insects and their biotic interactions and will acquire statistical knowledge in the field of data analysis.

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

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

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

a) written examination (approx. 30 to 60 minutes, including multiple choice questions) or b) log (10 to 30 pages) or c) oral examination of one candidate each (approx. 30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (approx. 20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Entrepreneurial Spirit in Biosciences			07-MUDB-102-m01
Module coordinator		**Module offered by**	
Coordinator BioCareers		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Companies are presented to students opt. together with cooperative workshops. These workshops may also deal with the process of founding start-up companies in the biotech or biomedical sectors. Topics on intellectual property protection are discussed.

Intended learning outcomes

Students gained an insight into the business plans and market of companies. They gained an insight into industrial research and development.

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

This module has 2 components; information on courses listed separately for each component.
- 07-MUDB-1-102: S (no information on language and number of weekly contact hours available)
- 07-MUDB-2-102: S (no information on language and number of weekly contact hours available)

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

This module has the following 2 assessment components. Unless stated otherwise, students must pass all of these assessment components to pass the module as a whole..

Assessment component to module component 07-MUDB-1-102: Unternehmerisches Denken Biowissenschaften
- 5 ECTS credits, method of grading: numerical grade
- Students will be informed about the method, length and scope of the assessment prior to the course. Usually, the following option will be chosen: a) written examination (30-60 minutes, auch Multiple Choice) or b) log (approx. 10-30 pages) or c) oral examination of on candidate each (30-60 minutes) or d) oral examination in groups up to three candidates (approx. 30-60 minutes) or e) presentation (20-45 minutes).

Assessment component to module component 07-MUDB-2-102: Interdisziplinäre Projektarbeit
- 5 ECTS credits, method of grading: numerical grade
- Students will be informed about the method, length and scope of the assessment prior to the course. Usually, the following option will be chosen: a) written examination (30-120 minutes) or b) log (ca.10-30 pages) or c) oral examination of on candidate each (20-30-60 minutes) or d) oral examination in groups up to three candidates (approx. 30-60 minutes) or e) presentation (20-45 minutes).

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)

Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Extracurricular Activities Outside of Natural Sciences 1			07-MV1-102-m01
Module coordinator		**Module offered by**	
Coordinator BioCareers		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
2	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	Please consult with course advisory service.	

Contents

Regular specific lecture, seminar, workshop, retreat or practical course (1 weekly contact hour), offered by JMU or other institutions, in which students will acquire additional skills in areas other than biology or the natural sciences. Assessment ungraded, pass required (2 ECTS credits); decision on credit transfer to be made by module coordinators. Possible subjects are philosophy, pedagogy, history, languages, social studies, psychology, economics, and law.

Intended learning outcomes

Specific skills and knowledge on a specific subject in an area other than biology or the natural sciences.

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

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

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

regular attendance as certified by the lecturer

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

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Extracurricular Activities Outside of Natural Sciences 2			07-MV2-102-m01
Module coordinator		**Module offered by**	
Coordinator BioCareers		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
3	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	Please consult with course advisory service.	

Contents

Regular specific lecture, seminar, workshop, retreat or practical course (1-2 weekly contact hours), offered by JMU or other institutions, in which students will acquire additional skills in areas other than biology or the natural sciences. Assessment ungraded, pass required (3 ECTS credits); decision on credit transfer to be made by module coordinators. Possible subjects are philosophy, pedagogy, history, languages, social studies, psychology, economics, and law.

Intended learning outcomes

Specific skills and knowledge on a specific subject in an area other than biology or the natural sciences.

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

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

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

Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Extracurricular Activities Outside of Natural Sciences 3			07-MV3-102-m01
Module coordinator		**Module offered by**	
Coordinator BioCareers		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
4	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	Please consult with course advisory service.	

Contents

Regular specific lecture, seminar, workshop, retreat or practical course (2 weekly contact hours), offered by JMU or other institutions, in which students will acquire additional skills in areas other than biology or the natural sciences. Assessment ungraded, pass required (4 ECTS credits); decision on credit transfer to be made by module coordinators. Possible subjects are philosophy, pedagogy, history, languages, social studies, psychology, economics, and law.

Intended learning outcomes

Specific skills and knowledge on a specific subject in an area other than biology or the natural sciences.

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

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

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

regular attendance as certified by the lecturer

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

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Extracurricular Activities Outside of Natural Sciences 4			07-MV4-102-m01
Module coordinator		**Module offered by**	
Coordinator BioCareers		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	Please consult with course advisory service.	

Contents

Regular specific lecture, seminar, workshop, retreat or practical course (3 weekly contact hours), offered by JMU or other institutions, in which students will acquire additional skills in areas other than biology or the natural sciences. Assessment ungraded, pass required (5 ECTS credits); decision on credit transfer to be made by module coordinators. Possible subjects are philosophy, pedagogy, history, languages, social studies, psychology, economics, and law.

Intended learning outcomes

Specific skills and knowledge on a specific subject in an area other than biology or the natural sciences.

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

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

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

Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Specific Curricular Activities in Biological Sciences 1			07-MVMINT1-102-m01
Module coordinator		**Module offered by**	
Coordinator BioCareers		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
2	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	Please consult with course advisory service.	

Contents

Regular specific lectures or seminars (1 weekly contact hour) in biological or natural sciences; assessment ungraded, pass required.

Intended learning outcomes

Specific skills and knowledge on an interdisciplinary subject in the biological or natural sciences.

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

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

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

regular attendance as certified by the lecturer

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

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Specific Curricular Activities in Biological Sciences 2			07-MVMINT2-102-m01
Module coordinator		**Module offered by**	
Coordinator BioCareers		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
3	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	Please consult with course advisory service.	

Contents

Regular specific lecture, seminar, workshop, retreat or practical course (1 weekly contact hour) in biological or natural sciences with a graded assessment.

Intended learning outcomes

Specific skills and knowledge on an interdisciplinary subject in the biological or natural sciences.

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

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

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

Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Specific Curricular Activities in Biological Sciences 3			07-MVMINT3-102-m01
Module coordinator		**Module offered by**	
Coordinator BioCareers		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
4	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	Please consult with course advisory service.	

Contents

Regular specific lecture, seminar, workshop, retreat or practical course (2 weekly contact hours) in biological or natural sciences; assessment ungraded, pass required.

Intended learning outcomes

Specific skills and knowledge on an interdisciplinary subject in the biological or natural sciences.

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

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

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

regular attendance as certified by the lecturer

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

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Specific Curricular Activities in Biological Sciences 4			07-MVMINT4-102-m01
Module coordinator		**Module offered by**	
Coordinator BioCareers		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
5	numerical grade	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	Please consult with course advisory service.	

Contents

Regular specific lecture, seminar, workshop, retreat or practical course (2 weekly contact hours) in biological or natural sciences with a graded assessment.

Intended learning outcomes

Specific skills and knowledge on an interdisciplinary subject in the biological or natural sciences.

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

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

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

Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2010)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Specific Curricular Activities in Biological Sciences 5			07-MVMINT5-112-m01
Module coordinator		**Module offered by**	
Coordinator BioCareers		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
6	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	Please consult with course advisory service.	

Contents

Regular specific lecture, seminar, workshop, retreat or practical course (3 weekly contact hours) in biological or natural sciences; assessment ungraded, pass required.

Intended learning outcomes

Specific skills and knowledge on an interdisciplinary subject in the biological or natural sciences.

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

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

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

successful completion as certified by the lecturer

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

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Epistemology and History of Science			07-MWIG-112-m01
Module coordinator		**Module offered by**	
Coordinator BioCareers		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
3	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

Philosophical foundations and scientific principles, history and theory of mind, human memory, intentional decision making and biochemical principles of cognitive and emotional processes. Fundamental terms and principles in biology are discussed.

Intended learning outcomes

The students are familiar with the hallmarks of the history of natural sciences. They have developed an increased awareness of how to use fundamental terms and definitions as well as of risks and concerns arising with knowledge and technical developments in the biosciences.

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

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

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

Students will be informed about the length and scope of the assessment prior to the course. Usually, one of the following options will be chosen: a) written examination (30 to 60 minutes, including multiple choice questions) or b) log (approx. 10 to 30 pages) or c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (approx. 30 to 60 minutes) or e) presentation (20 to 45 minutes)

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)

Module title			Abbreviation
Cell- and Development-Biology Master 1 B			07-MZE1-B-121-m01
Module coordinator		**Module offered by**	
holder of the Chair of Cell Biology and Developmental Biology		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
3	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

The lecture *Zellpathologie* (*Cytopathology*) describes pathological states of the cell and unravels their biological causes and consequences, such as infection, apoptosis, senescence, metabolic disorders and cancer.

Intended learning outcomes

Participants possess scientific background knowledge on cytopathology and are able to put this into the broader context of cell biology research.

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

V (no information on language and number of weekly contact hours available)

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

#REF!

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

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)
Master's degree (1 major) Biomedicine (2013)
Master's degree (1 major) Biomedicine (2012)

Module title			Abbreviation
Cell- and Development-Biology Master 2 B			07-MZE2-B-121-m01
Module coordinator		**Module offered by**	
holder of the Chair of Cell Biology and Developmental Biology		Faculty of Biology	
ECTS	**Method of grading**	**Only after succ. compl. of module(s)**	
3	(not) successfully completed	--	
Duration	**Module level**	**Other prerequisites**	
1 semester	graduate	--	

Contents

The lecture *Signale und Differenzierung* (*Signals and Differentiation*) is not designed to merely impart textbook knowledge to students. It will rather introduce students to particularly interesting and current topics in developmental biology. Topics covered in the lecture (subject to change): - Cooperation: Development and consequences of multicellularity. - Sex: More than just ? + ? =. - On the move: Morphogenetic migration. - All-rounders?: Opportunities and limitations of stem cell research. - Growing new hearts?: Animals and their ability to regenerate. - Disasters: What do we actually know about metamorphoses? - Always the same?: Plasticity and epigenetics. - Metaorganisms: We are never alone. - Development in changing environments: Ecology and polyphenism. - Developmental biology of behaviour: Everything is learned. Or isn't it? - Evo-devo: A fad? No, been around for ages.

Intended learning outcomes

Participants possess a knowledge of the theoretical and molecular biological principles underlying developmental biology and are able to put this into the broader context of cell and developmental biology research.

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

V (no information on language and number of weekly contact hours available)

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

#REF!

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

Master's degree (1 major) Biology (2011)
Master's degree (1 major) Biology (2014)
Master's degree (1 major) Biomedicine (2013)
Master's degree (1 major) Biomedicine (2012)