

Subdivided Module Catalogue for the Subject **Biosciences**

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

Examination regulations version: 2026
Responsible: Faculty of Biology

Learning Outcomes

German contents and learning outcome available but not translated yet.

Wissenschaftliche Befähigung

- Die Absolventinnen und Absolventen verstehen die mathematischen, theoretischen und experimentellen Grundlagen der Biologie und können diese anwenden.
- Die Absolventinnen und Absolventen können unter Anleitung Experimente durchführen, analysieren und die erhaltenen Ergebnisse darstellen und bewerten.
- Die Absolventinnen und Absolventen sind in der Lage, naturwissenschaftliche Probleme durch Anwendung der wissenschaftlichen Arbeitsweise und unter Beachtung der Regeln guter wissenschaftlicher Praxis (Dokumentation, Fehleranalyse) zu bearbeiten.
- Die Absolventinnen und Absolventen können ihr Wissen und ihre Erkenntnisse einem Fachpublikum gegenüber darstellen und vertreten.
- Die Absolventinnen und Absolventen können ein gewisses Grundlagenwissen aus Teilgebieten der Biologie abrufen.
- Die Absolventinnen und Absolventen verstehen die wesentlichen Zusammenhänge und Konzepte der einzelnen Teilgebiete der Biologie.
- Die Absolventinnen und Absolventen sind in der Lage, sich mit Hilfe von Fachliteratur in neue Aufgabengebiete einzuarbeiten und zu bewerten.
- Die Absolventinnen und Absolventen besitzen Abstraktionsvermögen, analytisches Denken, Problemlösungskompetenz und die Fähigkeit, komplexe Zusammenhänge zu strukturieren.

Befähigung zur Aufnahme einer Erwerbstätigkeit

- Die Absolventinnen und Absolventen können ihr Wissen und ihre Erkenntnisse einem Fachpublikum gegenüber darstellen und vertreten.
- Die Absolventinnen und Absolventen sind in der Lage, konstruktiv und zielorientiert in einem heterogenen Team zusammenzuarbeiten, unterschiedliche und abweichende Ansichten produktiv zur Zielerreichung zu nutzen und auftretende Konflikte zu lösen (Teamfähigkeit).
- Die Absolventinnen und Absolventen können ihre erworbenen Kompetenzen in unterschiedlichen interkulturellen Kontexten und in international zusammengesetzten Teams anwenden.
- Die Absolventinnen und Absolventen sind in der Lage, Probleme und deren Lösungen zielgruppengerecht und auch in einer Fremdsprache aufzubereiten und darzustellen.
- Die Absolventinnen und Absolventen sind in der Lage natur- und biowissenschaftliche Methoden unter Anleitung auf konkrete experimentelle oder theoretische biologische Aufgabenstellungen anzuwenden, Lösungswege zu entwickeln und die Ergebnisse zu interpretieren und zu bewerten.
- Die Absolventinnen und Absolventen kennen die wichtigsten Anforderungen und Arbeitsweisen im industriellen Umfeld sowie in Forschung und Entwicklung.
- Die Absolventinnen und Absolventen sind befähigt, komplexere Probleme zu analysieren und zu lösen und sich sehr schnell auch in weniger vertraute Themenkomplexe einzuarbeiten.

Persönlichkeitsentwicklung

- Die Absolventinnen und Absolventen kennen die Regeln guter wissenschaftlicher Praxis und beachten sie.
- Die Absolventinnen und Absolventen können ihr Wissen und ihre Erkenntnisse einem Fachpublikum gegenüber darstellen und vertreten.

Befähigung zum gesellschaftlichen Engagement

- Die Absolventinnen und Absolventen können ansatzweise naturwissenschaftliche Entwicklungen kritisch reflektieren und deren Auswirkungen auf die Wirtschaft, Gesellschaft und die Umwelt in Ansätzen erfassen (Technikfolgenabschätzung).

- Die Absolventinnen und Absolventen haben ihr Wissen bezüglich wirtschaftlicher, gesellschaftlicher, naturwissenschaftlicher, kultureller etc. Fragestellungen erweitert und können in Ansätzen begründet Position beziehen.
- Die Absolventinnen und Absolventen entwickeln die Bereitschaft und Fähigkeit, ihre Kompetenzen in partizipative Prozesse einzubringen und aktiv an Entscheidungen mitzuwirken.

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:

ASPO2015

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

??-???-2026 (2026-??)

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

The subject is divided into

Abbreviation	Module title	ECTS credits	Method of grading	page
Compulsory Electives (90 ECTS credits)				
Subtopic 1 (Primary Topic) (45 ECTS credits)				
Subtopic 2 (Secondary Topic) (30 ECTS credits)				
Subtopics 1 and 2 30 ECTS credits in subsidiary subject area, 45 ECTS credits in main subject area				
Module Group 1				
Neuroscience (0 or 30 or 45 ECTS credits)				
07-MS1-261-m01	Neurobiology, Behavioural Physiology and Animal Ecology	10	NUM	76
07-MS1N-152-m01	Molecular and Clinical Neurobiology	10	NUM	85
07-MS1CB-261-m01	Endogenous Clocks	10	NUM	78
07-MS1NFLS-261-m01	Flying Senses	10	NUM	90
07-MS1NMN-D-261-m01	Neuromodulation and Neuronal Development	10	NUM	92
07-MS1NB-261-m01	Neurogenetics of Behaviour	10	NUM	86
07-MS1NEC-152-m01	Developmental Neurobiology and Chronobiology	10	NUM	87
07-MS1NF1-261-m01	Neurobiology F1	10	NUM	88
07-MS1NF2-261-m01	Neurobiology F2	15	B/NB	89
Animal Ecology and Tropical Biology (0 or 30 or 45 ECTS credits)				
07-MS1-261-m01	Neurobiology, Behavioural Physiology and Animal Ecology	10	NUM	76
07-MS1TÖ-261-m01	Animal Ecology and Tropical Biology	10	NUM	94
07-MS1TÖ2-261-m01	Animal Ecology and Tropical Biology 2	10	NUM	93
07-MS1CONS-261-m01	Conservation Biology	10	NUM	82
07-MS1TÖF1-261-m01	Animal Ecology F1	10	NUM	95
07-MS1TÖF2-261-m01	Animal Ecology and Tropical Biology F2	15	B/NB	97
Behavioural Physiology and Sociobiology (0 or 30 or 45 ECTS credits)				
07-MS1-261-m01	Neurobiology, Behavioural Physiology and Animal Ecology	10	NUM	76
07-MS1K-261-m01	Animal Communication	10	NUM	84
07-MS1ES-261-m01	Experimental Sociobiology	10	NUM	83
07-MS1NB-261-m01	Neurogenetics of Behaviour	10	NUM	86
07-MS1VF1-261-m01	Behavioural Physiology and Sociobiology F1	10	NUM	98
07-MS1VF2-261-m01	Behavioural Physiology and Sociobiology F2	15	B/NB	99
Conservation Biology (0 or 30 or 45 ECTS credits) Students who selected this subject area must take module 07-MS1CONS.				
07-MS1-261-m01	Neurobiology, Behavioural Physiology and Animal Ecology	10	NUM	76
07-MS1CONS-261-m01	Conservation Biology	10	NUM	82
07-MS1TÖ2-261-m01	Animal Ecology and Tropical Biology 2	10	NUM	93
07-MS1TÖ-261-m01	Animal Ecology and Tropical Biology	10	NUM	94
07-MS1CBF1-261-m01	Conservation Biology F1	10	NUM	80
07-MS1CB-F2-261-m01	Conservation Biology F2	15	B/NB	81
Module Group 2				
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Molecular Cell and Developmental Biology (0 or 30 or 45 ECTS credits)				
07-MS2-261-m01	Molecular Biology	10	NUM	100
07-MS2ZE1-261-m01	Cell and Developmental Biology Master 1	10	NUM	126
07-MS2ZE2-261-m01	Cell and Developmental Biology Master 2	10	NUM	127
07-MS2ZEF1-261-m01	Cell and Developmental Biology F1	10	NUM	128
07-MS2ZE-F2-261-m01	Cell and Developmental Biology F2	15	B/NB	129
Topic: Molecular Parasitology (0 or 30 or 45 ECTS credits) Students who selected this subject area must take module 07-MSPAR. The second theoretical module in this subject area may be selected from the list below.				
07-MSPAR-261-m01	Molecular Parasitology	10	NUM	180
07-MS2-261-m01	Molecular Biology	10	NUM	100
07-MLS1-261-m01	Methods in Life Sciences	10	NUM	64
07-MSPARF1-261-m01	Molecular Parasitology F1	10	NUM	182
07-MSPARF2-261-m01	Molecular Parasitology F2	15	B/NB	183
Microbiology and Infection Biology (0 or 30 or 45 ECTS credits)				
07-MS2-261-m01	Molecular Biology	10	NUM	100
07-MS2INF-261-m01	Infection Biology	10	NUM	116
07-MS2PA-261-m01	Pathogenicity of Microorganisms	10	NUM	120
07-MS2MF1-261-m01	Microbiology F1	10	NUM	118
07-MS2MF2-261-m01	Microbiology F2	15	B/NB	119
Cellular and Molecular Biotechnology (0 or 30 or 45 ECTS credits)				
07-MS2-261-m01	Molecular Biology	10	NUM	100
07-MS2BT-261-m01	Biophysics and Molecular Biotechnology	10	NUM	105
07-MS3BB-261-m01	Biophysics and Biochemistry	10	NUM	142
07-MS2BI-261-m01	Bioinformatics	10	NUM	102
07-MS2BTF1-261-m01	Biophysics and Molecular Biotechnology F1	10	NUM	107
07-MS2BT-F2-261-m01	Biophysics and Molecular Biotechnology F2	15	B/NB	108
Tissue Engineering and regenerative Medicine (0 or 30 or 45 ECTS credits) Students who selected this subject area must take module 03-MSTE. The second theoretical module in this subject area may be selected from the list below.				
03-MSTE-261-m01	Tissue Engineering	10	NUM	31
07-MS2-261-m01	Molecular Biology	10	NUM	100
07-MLS1-261-m01	Methods in Life Sciences	10	NUM	64
03-MSTEF1-261-m01	Tissue engineering and regenerative Medicine F1	10	NUM	33
03-MSTEF2-261-m01	Tissue engineering and regenerative Medicine F2	15	B/NB	34
Bioinformatics (0 or 30 or 45 ECTS credits) Students who selected this subject area must take module 07-MS2BI. The second theoretical module in this subject area may be selected from the list below.				
07-MS2BI-261-m01	Bioinformatics	10	NUM	102
07-MS1-261-m01	Neurobiology, Behavioural Physiology and Animal Ecology	10	NUM	76
07-MS1N-152-m01	Molecular and Clinical Neurobiology	10	NUM	85
07-MS1TÖ-261-m01	Animal Ecology and Tropical Biology	10	NUM	94
07-MS1K-261-m01	Animal Communication	10	NUM	84
07-MS2-261-m01	Molecular Biology	10	NUM	100
07-MS2ZE1-261-m01	Cell and Developmental Biology Master 1	10	NUM	126

07-MS2ZE2-261-m01	Cell and Developmental Biology Master 2	10	NUM	127
07-MS2INF-261-m01	Infection Biology	10	NUM	116
07-MS2PA-261-m01	Pathogenicity of Microorganisms	10	NUM	120
07-MS2IM1-261-m01	Immunology 1	10	NUM	112
07-MS2IM2-261-m01	Immunology 2	10	NUM	113
03-MSMV-261-m01	Molecular Virology	10	NUM	27
07-MS2HG-152-m01	Human Genetics	10	NUM	109
07-MS31-261-m01	Current Methods in Biology	10	NUM	132
07-MS31PLA-261-m01	Plant Adaptations	10	NUM	138
07-MS31PIP-261-m01	Plant Immunobiology and Pharmaceutical Biology	10	NUM	136
07-MS3BB-261-m01	Biophysics and Biochemistry	10	NUM	142
07-MS3S-261-m01	Systems Biology	10	NUM	159
07-MS2BIF1-261-m01	Bioinformatics F1	10	NUM	103
07-MS2BIF2-261-m01	Bioinformatics F2	15	B/NB	104
Computational Biology (0 or 30 or 45 ECTS credits)				
07-MS3TSY-152-m01	Topics in Systems Biology	10	NUM	164
07-MS2TBI-152-m01	Topics in Bioinformatics	10	NUM	125
07-MS3COB-F1-261-m01	Computational Biology F1	10	NUM	148
07-MS3COB-F2-261-m01	Computational Biology F2	15	B/NB	149
Immunology (0 or 30 or 45 ECTS credits)				
07-MS2IM1-261-m01	Immunology 1	10	NUM	112
07-MS2IM2-261-m01	Immunology 2	10	NUM	113
07-MS2IMF1-261-m01	Immunology F1	10	NUM	114
07-MS2IM-F2-261-m01	Immunology F2	15	B/NB	115
Molecular Virology (0 or 30 or 45 ECTS credits) Students who selected this subject area must take module 03-MSMV. The second theoretical module in this subject area may be selected from the list below.				
03-MSMV-261-m01	Molecular Virology	10	NUM	27
07-MS2-261-m01	Molecular Biology	10	NUM	100
07-MLS1-261-m01	Methods in Life Sciences	10	NUM	64
03-MSMVF1-261-m01	Molecular Virology F1	10	NUM	29
03-MSMVF2-261-m01	Molecular Virology F2	15	B/NB	30
Human Genetics (0 or 30 or 45 ECTS credits) Students who selected this subject area must take module 07-MS2HG. The second theoretical module in this subject area may be selected from the list below.				
07-MS2HG-152-m01	Human Genetics	10	NUM	109
07-MS2-261-m01	Molecular Biology	10	NUM	100
07-MS2ZE1-261-m01	Cell and Developmental Biology Master 1	10	NUM	126
07-MS2ZE2-261-m01	Cell and Developmental Biology Master 2	10	NUM	127
07-MS2INF-261-m01	Infection Biology	10	NUM	116
07-MS2PA-261-m01	Pathogenicity of Microorganisms	10	NUM	120
07-MS2IM1-261-m01	Immunology 1	10	NUM	112
07-MS2IM2-261-m01	Immunology 2	10	NUM	113
03-MSMV-261-m01	Molecular Virology	10	NUM	27

07-MS2HG-F1-261-mo1	Human Genetics F1	10	NUM	110
07-MS2HG-F2-261-mo1	Human Genetics F2	15	B/NB	111
Physiological Chemistry (0 or 30 or 45 ECTS credits) Students who selected this subject area must take module 07-MS2 and must select either module 07-MS2ZE1 or module 07-MS2ZE2 as their second theoretical module.				
07-MS2-261-mo1	Molecular Biology	10	NUM	100
07-MS2ZE1-261-mo1	Cell and Developmental Biology Master 1	10	NUM	126
07-MS2ZE2-261-mo1	Cell and Developmental Biology Master 2	10	NUM	127
07-MS2ZEF1-261-mo1	Cell and Developmental Biology F1	10	NUM	128
07-MSL2-261-mo1	Laboratory Course 2	10	B/NB	176
07-MSLRTF1-261-mo1	Laboratory Research Training F1	10	NUM	178
07-MS2PHF2-261-mo1	Physiological Chemistry F2	15	B/NB	124
Cellular Tumor Biology (0 or 30 or 45 ECTS credits)				
07-TUM-MOL-152-mo1	Molecular Tumor Biology	5	NUM	210
07-TUM-CLIN-152-mo1	Clinical Tumor Biology	5	NUM	209
07-MS2-261-mo1	Molecular Biology	10	NUM	100
07-MS2ZE1-261-mo1	Cell and Developmental Biology Master 1	10	NUM	126
07-MS2ZE2-261-mo1	Cell and Developmental Biology Master 2	10	NUM	127
07-MS2INF-261-mo1	Infection Biology	10	NUM	116
07-MS2PA-261-mo1	Pathogenicity of Microorganisms	10	NUM	120
07-MS2IM1-261-mo1	Immunology 1	10	NUM	112
07-MS2IM2-261-mo1	Immunology 2	10	NUM	113
03-MSMV-261-mo1	Molecular Virology	10	NUM	27
07-MS2HG-152-mo1	Human Genetics	10	NUM	109
07-MSLRTF1-261-mo1	Laboratory Research Training F1	10	NUM	178
07-MSL2-261-mo1	Laboratory Course 2	10	B/NB	176
07-MS2ZTF1-261-mo1	Cellular Tumor Biology F1	10	NUM	130
07-MS2ZTF2-261-mo1	Cellular Tumor Biology F2	15	B/NB	131
Module Group 3				
Molecular Plant Physiology (0 or 30 or 45 ECTS credits)				
07-MS31-261-mo1	Current Methods in Biology	10	NUM	132
07-MS31PLA-261-mo1	Plant Adaptations	10	NUM	138
07-MS31PIP-261-mo1	Plant Immunobiology and Pharmaceutical Biology	10	NUM	136
07-MS3BB-261-mo1	Biophysics and Biochemistry	10	NUM	142
07-MS31MPP-F1-261-mo1	Molecular Plant Physiology F1	10	NUM	134
07-MS31MPP-F2-261-mo1	Molecular Plant Physiology F2	15	B/NB	135
Biochemistry and Structural Biology (0 or 30 or 45 ECTS credits)				
07-MS31-261-mo1	Current Methods in Biology	10	NUM	132
07-MS3BB-261-mo1	Biophysics and Biochemistry	10	NUM	142
07-MS2BT-261-mo1	Biophysics and Molecular Biotechnology	10	NUM	105
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07-MS31PIP-261-mo1	Plant Immunobiology and Pharmaceutical Biology	10	NUM	136
07-MS31PLA-261-mo1	Plant Adaptations	10	NUM	138
07-MS3BSBF1-261-mo1	Biochemistry and Structural Biology F1	10	NUM	146
07-MS3BSBF2-261-mo1	Biochemistry and Structural Biology F2	15	B/NB	147
Molecular Membrane Biology (0 or 30 or 45 ECTS credits)				
07-MS31-261-mo1	Current Methods in Biology	10	NUM	132
07-MS3BB-261-mo1	Biophysics and Biochemistry	10	NUM	142
07-MS2BT-261-mo1	Biophysics and Molecular Biotechnology	10	NUM	105
07-MS31PIP-261-mo1	Plant Immunobiology and Pharmaceutical Biology	10	NUM	136
07-MS31PLA-261-mo1	Plant Adaptations	10	NUM	138
07-MS3BPF1-261-mo1	Biophysics of Plant Membrane Proteins F1	10	NUM	144
07-MS3B-PF2-261-mo1	Biophysics of Plant Membrane Proteins F2	15	B/NB	145
Plant Signalling (0 or 30 or 45 ECTS credits)				
07-MS31-261-mo1	Current Methods in Biology	10	NUM	132
07-MS3BB-261-mo1	Biophysics and Biochemistry	10	NUM	142
07-MS31PIP-261-mo1	Plant Immunobiology and Pharmaceutical Biology	10	NUM	136
07-MS31PLA-261-mo1	Plant Adaptations	10	NUM	138
07-MS3SPF1-261-mo1	Plant Signalling F1	10	NUM	160
07-MS3S-PF2-261-mo1	Plant Signalling F2	15	B/NB	161
Plant Chemical Biology & Metabolism (0 or 30 or 45 ECTS credits)				
07-MS31-261-mo1	Current Methods in Biology	10	NUM	132
07-MS31PIP-261-mo1	Plant Immunobiology and Pharmaceutical Biology	10	NUM	136
07-MS3BB-261-mo1	Biophysics and Biochemistry	10	NUM	142
07-MS31PLA-261-mo1	Plant Adaptations	10	NUM	138
07-MS2-261-mo1	Molecular Biology	10	NUM	100
07-MS2BI-261-mo1	Bioinformatics	10	NUM	102
07-MS3S-261-mo1	Systems Biology	10	NUM	159
07-MS1-261-mo1	Neurobiology, Behavioural Physiology and Animal Ecology	10	NUM	76
07-MS3PCB-F1-261-mo1	Plant Chemical Biology and Metabolism F1	10	NUM	154
07-MS3PCB-F2-261-mo1	Plant Chemical Biology and Metabolism F2	15	B/NB	156
Physiological Plant Ecology (0 or 30 or 45 ECTS credits)				
07-MS31-261-mo1	Current Methods in Biology	10	NUM	132
07-MS3BB-261-mo1	Biophysics and Biochemistry	10	NUM	142
07-MS31PIP-261-mo1	Plant Immunobiology and Pharmaceutical Biology	10	NUM	136
07-MS31PLA-261-mo1	Plant Adaptations	10	NUM	138
07-MS3PPE-F1-261-mo1	Physiological Plant Ecology F1	10	NUM	157
07-MS3PPE-F2-261-mo1	Physiological Plant Ecology F2	15	B/NB	158
Molecular Plant - Microbe-Interactions (0 or 30 or 45 ECTS credits)				

07-MS31-261-mo1	Current Methods in Biology	10	NUM	132
07-MS3BB-261-mo1	Biophysics and Biochemistry	10	NUM	142
07-MS31PIP-261-mo1	Plant Immunobiology and Pharmaceutical Biology	10	NUM	136
07-MS31PLA-261-mo1	Plant Adaptations	10	NUM	138
07-MS3MP-MIF1-261-mo1	Molecular Plant-Microbe-Interactions F1	10	NUM	152
07-MS3MP-MIF2-261-mo1	Molecular Plant-Microbe-Interactions F2	15	B/NB	153
07-MS3GSSF1-261-mo1	Genetics of Systemic Signalling in Plants F1	10	NUM	150
07-MS3GSSF2-261-mo1	Genetics of Systemic Signalling in Plants F2	15	B/NB	151
Systems Biology (0 or 30 or 45 ECTS credits) Students who selected this subject area must take module 07-MS3S.				
07-MS3S-261-mo1	Systems Biology	10	NUM	159
07-MS2BI-261-mo1	Bioinformatics	10	NUM	102
07-MS1-261-mo1	Neurobiology, Behavioural Physiology and Animal Ecology	10	NUM	76
07-MS1N-152-mo1	Molecular and Clinical Neurobiology	10	NUM	85
07-MS1TÖ-261-mo1	Animal Ecology and Tropical Biology	10	NUM	94
07-MS1K-261-mo1	Animal Communication	10	NUM	84
07-MS2-261-mo1	Molecular Biology	10	NUM	100
07-MS2ZE1-261-mo1	Cell and Developmental Biology Master 1	10	NUM	126
07-MS2ZE2-261-mo1	Cell and Developmental Biology Master 2	10	NUM	127
07-MS2INF-261-mo1	Infection Biology	10	NUM	116
07-MS2PA-261-mo1	Pathogenicity of Microorganisms	10	NUM	120
07-MS2IM1-261-mo1	Immunology 1	10	NUM	112
07-MS2IM2-261-mo1	Immunology 2	10	NUM	113
03-MSMV-261-mo1	Molecular Virology	10	NUM	27
07-MS2HG-152-mo1	Human Genetics	10	NUM	109
07-MS31-261-mo1	Current Methods in Biology	10	NUM	132
07-MS3BB-261-mo1	Biophysics and Biochemistry	10	NUM	142
07-MS31PIP-261-mo1	Plant Immunobiology and Pharmaceutical Biology	10	NUM	136
07-MS31PLA-261-mo1	Plant Adaptations	10	NUM	138
07-MS3SYF1-261-mo1	Systems Biology F1	10	NUM	162
07-MS3SYF2-261-mo1	Systems Biology F2	15	B/NB	163
Program: Neuroethology The topics "Neurogenetics" and "Behavioural Physiology and Sociobiology" have to be combined.				
Neuroethology - Neurogenetics (0 or 30 or 45 ECTS credits)				
07-MS1NB-261-mo1	Neurogenetics of Behaviour	10	NUM	86
07-MS1CB-261-mo1	Endogenous Clocks	10	NUM	78
07-MS1NFLS-261-mo1	Flying Senses	10	NUM	90
07-MS1NF1-261-mo1	Neurobiology F1	10	NUM	88
07-MS1NF2-261-mo1	Neurobiology F2	15	B/NB	89
Neuroethology - Behavioural Physiology and Sociobiology (0 or 30 or 45 ECTS credits)				
07-MS1-261-mo1	Neurobiology, Behavioural Physiology and Animal Ecology	10	NUM	76
07-MS1ES-261-mo1	Experimental Sociobiology	10	NUM	83
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07-MS1VF1-261-m01	Behavioural Physiology and Sociobiology F1	10	NUM	98
07-MS1VF2-261-m01	Behavioural Physiology and Sociobiology F2	15	B/NB	99
Program: Cell and Infection Biology Two topics out of "Cell and Developmental Biology", "Molecular Parasitology", "Microbiology", "Immunology", "Molecular Virology" have to be combined.				
Cell and Developmental Biology (0 or 30 or 45 ECTS credits)				
07-MS2-261-m01	Molecular Biology	10	NUM	100
07-MS2ZE1-261-m01	Cell and Developmental Biology Master 1	10	NUM	126
07-MS2ZE2-261-m01	Cell and Developmental Biology Master 2	10	NUM	127
07-MLS1-261-m01	Methods in Life Sciences	10	NUM	64
07-MSPAR-261-m01	Molecular Parasitology	10	NUM	180
07-MS4MMB-F1-261-m01	Methods in Molecular Biology F1	10	NUM	165
07-MS4PMB-F1-261-m01	Principles in Molecular Biology F1	10	NUM	166
07-MS2ZEF1-261-m01	Cell and Developmental Biology F1	10	NUM	128
07-MS2ZE-F2-261-m01	Cell and Developmental Biology F2	15	B/NB	129
Topic: Molecular Parasitology (0 or 30 or 45 ECTS credits) Students who selected this subject area must take module 07-MSPAR. The second theoretical module in this subject area may be selected from the list below.				
07-MSPAR-261-m01	Molecular Parasitology	10	NUM	180
07-MS2-261-m01	Molecular Biology	10	NUM	100
07-MLS1-261-m01	Methods in Life Sciences	10	NUM	64
07-MS4MMB-F1-261-m01	Methods in Molecular Biology F1	10	NUM	165
07-MS4PMB-F1-261-m01	Principles in Molecular Biology F1	10	NUM	166
07-MS2PAR-F1-261-m01	Molecular Parasitology F1	10	NUM	122
07-MS2PAR-F2-261-m01	Molecular Parasitology F2	15	B/NB	123
Microbiology (0 or 30 or 45 ECTS credits)				
07-MS2-261-m01	Molecular Biology	10	NUM	100
07-MLS1-261-m01	Methods in Life Sciences	10	NUM	64
07-MSPAR-261-m01	Molecular Parasitology	10	NUM	180
07-MS2PA-261-m01	Pathogenicity of Microorganisms	10	NUM	120
07-MS4MMB-F1-261-m01	Methods in Molecular Biology F1	10	NUM	165
07-MS4PMB-F1-261-m01	Principles in Molecular Biology F1	10	NUM	166
07-MS2MF1-261-m01	Microbiology F1	10	NUM	118
07-MS2MF2-261-m01	Microbiology F2	15	B/NB	119
Immunology (0 or 30 or 45 ECTS credits)				
07-MS2IM1-261-m01	Immunology 1	10	NUM	112
07-MS2IM2-261-m01	Immunology 2	10	NUM	113
07-MS2IMF1-261-m01	Immunology F1	10	NUM	114

07-MS2IM-F2-261-m01	Immunology F2	15	B/NB	115
Molecular Virology (0 or 30 or 45 ECTS credits) Students who selected this subject area must take module 03-MSMV. The second theoretical module in this subject area may be selected from the list below.				
03-MSMV-261-m01	Molecular Virology	10	NUM	27
07-MS2-261-m01	Molecular Biology	10	NUM	100
07-MLS1-261-m01	Methods in Life Sciences	10	NUM	64
03-MSMVF1-261-m01	Molecular Virology F1	10	NUM	29
03-MSMVF2-261-m01	Molecular Virology F2	15	B/NB	30
Program: Systems Biology and Metabolomics The topics "Systems Biology" and "Metabolomics" have to be combined.				
Systems Biology (0 or 30 or 45 ECTS credits)				
07-MS3TSY-152-m01	Topics in Systems Biology	10	NUM	164
07-MS1-261-m01	Neurobiology, Behavioural Physiology and Animal Ecology	10	NUM	76
07-MS3SYF1-261-m01	Systems Biology F1	10	NUM	162
07-MS3SYF2-261-m01	Systems Biology F2	15	B/NB	163
Metabolomics (0 or 30 or 45 ECTS credits) Students must combine the topics "Systems Biology and Metabolomics -- Systems Biology" and "Systems Biology and Metabolomics -- Metabolomics".				
07-MS2-261-m01	Molecular Biology	10	NUM	100
07-MS2TBI-152-m01	Topics in Bioinformatics	10	NUM	125
07-MS2ZE2-261-m01	Cell and Developmental Biology Master 2	10	NUM	127
07-MS3PCB-F1-261-m01	Plant Chemical Biology and Metabolism F1	10	NUM	154
07-MS3PCB-F2-261-m01	Plant Chemical Biology and Metabolism F2	15	B/NB	156
Program: Molecular and Computational Biology The major topic "Computational Biology" has to be combined with one of the following topics: "Molecular Biology", "Protein Chemistry", "Molecular and Cellular Biophysics",				
Computational Biology (Major) (0 or 30 or 45 ECTS credits)				
07-MS3TSY-152-m01	Topics in Systems Biology	10	NUM	164
07-MS2TBI-152-m01	Topics in Bioinformatics	10	NUM	125
07-MS3COB-F1-261-m01	Computational Biology F1	10	NUM	148
07-MS3COB-F2-261-m01	Computational Biology F2	15	B/NB	149
Molecular Biology (0 or 30 or 45 ECTS credits)				
07-MS2-261-m01	Molecular Biology	10	NUM	100
07-MLS1-261-m01	Methods in Life Sciences	10	NUM	64
07-MLS2-261-m01	Topics and Concepts in Life Sciences	10	NUM	66
07-MS2PA-261-m01	Pathogenicity of Microorganisms	10	NUM	120
07-MSF1-261-m01	Molecular Biology F1	10	NUM	173
07-MSF2-261-m01	Molecular Biology F2	15	B/NB	174
Protein Chemistry (0 or 30 or 45 ECTS credits)				
07-MS3BB-261-m01	Biophysics and Biochemistry	10	NUM	142
07-MS2BT-261-m01	Biophysics and Molecular Biotechnology	10	NUM	105

07-MS3BSBF1-261-mo1	Biochemistry and Structural Biology F1	10	NUM	146
07-MS3BSBF2-261-mo1	Biochemistry and Structural Biology F2	15	B/NB	147
Molecular and Cellular Biophysics (0 or 30 or 45 ECTS credits)				
07-MS3BB-261-mo1	Biophysics and Biochemistry	10	NUM	142
07-MS2BT-261-mo1	Biophysics and Molecular Biotechnology	10	NUM	105
07-MS3BPF1-261-mo1	Biophysics of Plant Membrane Proteins F1	10	NUM	144
07-MS3B-PF2-261-mo1	Biophysics of Plant Membrane Proteins F2	15	B/NB	145
07-MS2BTF1-261-mo1	Biophysics and Molecular Biotechnology F1	10	NUM	107
07-MS2BT-F2-261-mo1	Biophysics and Molecular Biotechnology F2	15	B/NB	108
Program: Protein Chemistry The major topic "Protein Chemistry" has to be combined with the topic "Computational Biology".				
Protein Chemistry (Major) (0 or 30 or 45 ECTS credits)				
07-MS3BB-261-mo1	Biophysics and Biochemistry	10	NUM	142
07-MS2BT-261-mo1	Biophysics and Molecular Biotechnology	10	NUM	105
07-MS3BSBF1-261-mo1	Biochemistry and Structural Biology F1	10	NUM	146
07-MS3BSBF2-261-mo1	Biochemistry and Structural Biology F2	15	B/NB	147
Computational Biology (0 or 30 or 45 ECTS credits)				
07-MS3TSY-152-mo1	Topics in Systems Biology	10	NUM	164
07-MS2TBI-152-mo1	Topics in Bioinformatics	10	NUM	125
07-MS3COB-F1-261-mo1	Computational Biology F1	10	NUM	148
07-MS3COB-F2-261-mo1	Computational Biology F2	15	B/NB	149
Program: Molecular and Cellular Biophysics The major topic "Molecular and Cellular Biophysics" has to be combined with the topic "Computational Biology".				
Molecular and Cellular Biophysics (Major) (0 or 30 or 45 ECTS credits)				
07-MS3BB-261-mo1	Biophysics and Biochemistry	10	NUM	142
07-MS2BT-261-mo1	Biophysics and Molecular Biotechnology	10	NUM	105
07-MS3BPF1-261-mo1	Biophysics of Plant Membrane Proteins F1	10	NUM	144
07-MS3B-PF2-261-mo1	Biophysics of Plant Membrane Proteins F2	15	B/NB	145
07-MS2BTF1-261-mo1	Biophysics and Molecular Biotechnology F1	10	NUM	107
07-MS2BT-F2-261-mo1	Biophysics and Molecular Biotechnology F2	15	B/NB	108
Computational Biology (0 or 30 or 45 ECTS credits)				
07-MS3TSY-152-mo1	Topics in Systems Biology	10	NUM	164
07-MS2TBI-152-mo1	Topics in Bioinformatics	10	NUM	125
07-MS3COB-F1-261-mo1	Computational Biology F1	10	NUM	148
07-MS3COB-F2-261-mo1	Computational Biology F2	15	B/NB	149

Program: Ecology				
Two of the topics "Plant Ecology", "Animal Ecology" and "Conservation Biology" have to be combined.				
Plant Ecology (0 or 30 or 45 ECTS credits)				
If this topic is chosen as major, the module 07-MS31PLA has to be selected.				
07-MS31PLA-261-m01	Plant Adaptations	10	NUM	138
07-MS31-261-m01	Current Methods in Biology	10	NUM	132
07-MS1CONS-261-m01	Conservation Biology	10	NUM	82
07-MS3PPE-F1-261-m01	Physiological Plant Ecology F1	10	NUM	157
07-MS3PPE-F2-261-m01	Physiological Plant Ecology F2	15	B/NB	158
07-MS3MP-MIF1-261-m01	Molecular Plant-Microbe-Interactions F1	10	NUM	152
07-MS3MP-MIF2-261-m01	Molecular Plant-Microbe-Interactions F2	15	B/NB	153
Animal Ecology (0 or 30 or 45 ECTS credits)				
07-MS1-261-m01	Neurobiology, Behavioural Physiology and Animal Ecology	10	NUM	76
07-MS1TÖ-261-m01	Animal Ecology and Tropical Biology	10	NUM	94
07-MS1TÖ2-261-m01	Animal Ecology and Tropical Biology 2	10	NUM	93
07-MS1CONS-261-m01	Conservation Biology	10	NUM	82
07-MS1TÖF1-261-m01	Animal Ecology F1	10	NUM	95
07-MS1TÖF2-261-m01	Animal Ecology and Tropical Biology F2	15	B/NB	97
Conservation Biology (0 or 30 or 45 ECTS credits)				
For choosing the topic as Major, 07-MS1CONS must be selected, the second theory module has to be chosen among those listed below in this topic.				
07-MS1-261-m01	Neurobiology, Behavioural Physiology and Animal Ecology	10	NUM	76
07-MS1TÖ2-261-m01	Animal Ecology and Tropical Biology 2	10	NUM	93
07-MS1CONS-261-m01	Conservation Biology	10	NUM	82
07-MS31PLA-261-m01	Plant Adaptations	10	NUM	138
07-MS1CBF1-261-m01	Conservation Biology F1	10	NUM	80
07-MS1CB-F2-261-m01	Conservation Biology F2	15	B/NB	81
Program: Conservation Biology and Applied Ecology				
The topics "Conservation Biology" and "Animal Ecology" have to be combined.				
Animal Ecology (0 or 30 or 45 ECTS credits)				
07-MS1-261-m01	Neurobiology, Behavioural Physiology and Animal Ecology	10	NUM	76
07-MS1TÖ-261-m01	Animal Ecology and Tropical Biology	10	NUM	94
07-MS1TÖ2-261-m01	Animal Ecology and Tropical Biology 2	10	NUM	93
07-MS1CONS-261-m01	Conservation Biology	10	NUM	82
07-MS1TÖF1-261-m01	Animal Ecology F1	10	NUM	95
07-MS1TÖF2-261-m01	Animal Ecology and Tropical Biology F2	15	B/NB	97
Conservation Biology (0 or 30 or 45 ECTS credits)				
For choosing the topic as Major, 07-MS1CONS must be selected, the second theory module has to be chosen among those listed below in this topic.				
07-MS1-261-m01	Neurobiology, Behavioural Physiology and Animal Ecology	10	NUM	76

07-MS1TÖ2-261-m01	Animal Ecology and Tropical Biology 2	10	NUM	93
07-MS1CONS-261-m01	Conservation Biology	10	NUM	82
07-MS31PLA-261-m01	Plant Adaptations	10	NUM	138
07-MS1CBF1-261-m01	Conservation Biology F1	10	NUM	80
07-MS1CB-F2-261-m01	Conservation Biology F2	15	B/NB	81
Program: Molecular Plant Sciences Two of the following topics have to be combined: "Plant Signalling Networks", "Plant Chemical Biology and Metabolism", "Plant Biotic Interactions", "Plant Adaptations to a changing world", "Plant Membrane Biology", "Structural Biology".				
Plant Signaling Networks (0 or 30 or 45 ECTS credits) If this topic is chosen as major, the modules 07-MS3SPF1 and 07-MS3SPF2 have to be selected.				
07-MS31-261-m01	Current Methods in Biology	10	NUM	132
07-MS31PLA-261-m01	Plant Adaptations	10	NUM	138
07-MS31PIP-261-m01	Plant Immunobiology and Pharmaceutical Biology	10	NUM	136
07-MS3BB-261-m01	Biophysics and Biochemistry	10	NUM	142
07-MS4PMB-F1-261-m01	Principles in Molecular Biology F1	10	NUM	166
07-MS4MMB-F1-261-m01	Methods in Molecular Biology F1	10	NUM	165
07-MS3SPF1-261-m01	Plant Signalling F1	10	NUM	160
07-MS3S-PF2-261-m01	Plant Signalling F2	15	B/NB	161
Plant Chemical Biology and Metabolism (0 or 30 or 45 ECTS credits) If this topic is chosen as major, the modules 07-MS3PCBF1 and 07-MS3PCBF2 have to be selected.				
07-MS31-261-m01	Current Methods in Biology	10	NUM	132
07-MS31PLA-261-m01	Plant Adaptations	10	NUM	138
07-MS31PIP-261-m01	Plant Immunobiology and Pharmaceutical Biology	10	NUM	136
07-MS3BB-261-m01	Biophysics and Biochemistry	10	NUM	142
07-MS4PMB-F1-261-m01	Principles in Molecular Biology F1	10	NUM	166
07-MS4MMB-F1-261-m01	Methods in Molecular Biology F1	10	NUM	165
07-MS3PCB-F1-261-m01	Plant Chemical Biology and Metabolism F1	10	NUM	154
07-MS3PCB-F2-261-m01	Plant Chemical Biology and Metabolism F2	15	B/NB	156
Plant Biotic Interactions (0 or 30 or 45 ECTS credits) If this topic is chosen as major, the modules 07-MS3MPMIF1 and 07-MS3MPMIF2 have to be selected.				
07-MS31-261-m01	Current Methods in Biology	10	NUM	132
07-MS31PLA-261-m01	Plant Adaptations	10	NUM	138
07-MS31PIP-261-m01	Plant Immunobiology and Pharmaceutical Biology	10	NUM	136
07-MS3BB-261-m01	Biophysics and Biochemistry	10	NUM	142
07-MS4PMB-F1-261-m01	Principles in Molecular Biology F1	10	NUM	166
07-MS4MMB-F1-261-m01	Methods in Molecular Biology F1	10	NUM	165

07-MS3MP-MIF1-261-m01	Molecular Plant-Microbe-Interactions F1	10	NUM	152
07-MS3MP-MIF2-261-m01	Molecular Plant-Microbe-Interactions F2	15	B/NB	153
Plant Adaptations to a changing world (0 or 30 or 45 ECTS credits) If this topic is chosen as major, the modules 07-MS31MPPF1 and 07-MS31MPPF2 or the modules 07-MS3PPEF1 and 07-MS3PPEF2 have to be selected.				
07-MS31-261-m01	Current Methods in Biology	10	NUM	132
07-MS31PLA-261-m01	Plant Adaptations	10	NUM	138
07-MS31PIP-261-m01	Plant Immunobiology and Pharmaceutical Biology	10	NUM	136
07-MS3BB-261-m01	Biophysics and Biochemistry	10	NUM	142
07-MS4PMB-F1-261-m01	Principles in Molecular Biology F1	10	NUM	166
07-MS4MMB-F1-261-m01	Methods in Molecular Biology F1	10	NUM	165
07-MS31MPP-F1-261-m01	Molecular Plant Physiology F1	10	NUM	134
07-MS31MPP-F2-261-m01	Molecular Plant Physiology F2	15	B/NB	135
07-MS3PPE-F1-261-m01	Physiological Plant Ecology F1	10	NUM	157
07-MS3PPE-F2-261-m01	Physiological Plant Ecology F2	15	B/NB	158
Plant Membrane Biology (0 or 30 or 45 ECTS credits) If this topic is chosen as major, the modules 07-MS3BPF1 and 07-MS3BPF2 have to be selected.				
07-MS31-261-m01	Current Methods in Biology	10	NUM	132
07-MS31PLA-261-m01	Plant Adaptations	10	NUM	138
07-MS31PIP-261-m01	Plant Immunobiology and Pharmaceutical Biology	10	NUM	136
07-MS3BB-261-m01	Biophysics and Biochemistry	10	NUM	142
07-MS4PMB-F1-261-m01	Principles in Molecular Biology F1	10	NUM	166
07-MS4MMB-F1-261-m01	Methods in Molecular Biology F1	10	NUM	165
07-MS3BPF1-261-m01	Biophysics of Plant Membrane Proteins F1	10	NUM	144
07-MS3B-PF2-261-m01	Biophysics of Plant Membrane Proteins F2	15	B/NB	145
Structural Biology (0 or 30 or 45 ECTS credits) If this topic is chosen as major, the modules 07-MS3BSBF1 and 07-MS3BSBF2 have to be selected.				
07-MS3BB-261-m01	Biophysics and Biochemistry	10	NUM	142
07-MS2BT-261-m01	Biophysics and Molecular Biotechnology	10	NUM	105
07-MS4MMB-F1-261-m01	Methods in Molecular Biology F1	10	NUM	165
07-MS4PMB-F1-261-m01	Principles in Molecular Biology F1	10	NUM	166
07-MS3BSBF1-261-m01	Biochemistry and Structural Biology F1	10	NUM	146
07-MS3BSBF2-261-m01	Biochemistry and Structural Biology F2	15	B/NB	147

Additional Laboratory Courses and Internships				
07-MSL2-261-m01	Laboratory Course 2	10	B/NB	176
07-MSL3-261-m01	Laboratory Course 3	15	B/NB	177
07-MSA2-261-m01	External Internship 2	10	B/NB	168
07-MSA3-261-m01	External Internship 3	15	B/NB	169
Subtopic Additional Achievements (15 ECTS credits)				
07-MSL1-261-m01	Laboratory Course 1	5	B/NB	175
07-MSL2-261-m01	Laboratory Course 2	10	B/NB	176
07-MSL3-261-m01	Laboratory Course 3	15	B/NB	177
07-MSA1-261-m01	External Internship 1	5	B/NB	167
07-MSA2-261-m01	External Internship 2	10	B/NB	168
07-MSA3-261-m01	External Internship 3	15	B/NB	169
07-MSCC-261-m01	Biochemistry, Physiology and Genetics of Mammalian Cell Culture	5	B/NB	171
03-MSMT-252-m01	Molecular Techniques	3	B/NB	26
07-ML-261-m01	Linux and Perl	5	B/NB	63
03-MSTEAT-261-m01	Tissue engineering as alternative for animal testing	5	B/NB	32
07-MSWSA-261-m01	Workshop on scientific approaches	5	B/NB	186
03-MSKVir-261-m01	Clinical Virology for Biosciences	5	NUM	25
07-MSTROPS-261-m01	Seminar Tropical Biology	5	B/NB	185
07-MLS1B-261-m01	Methods in Life Sciences B	7	B/NB	65
07-MLS1-261-m01	Methods in Life Sciences	10	NUM	64
07-MLS2B-261-m01	Topics and Concepts in Life Sciences B	7	B/NB	67
07-MLS2-261-m01	Topics and Concepts in Life Sciences	10	NUM	66
07-TUM-MOL-152-m01	Molecular Tumor Biology	5	NUM	210
07-TUM-CLIN-152-m01	Clinical Tumor Biology	5	NUM	209
07-MS31B-261-m01	Current Methods in Biology B	7	B/NB	133
07-MS31PLAB-261-m01	Plant Adaptations B	5	B/NB	140
07-MS31PIPB-261-m01	Plant Immunobiology and Pharmaceutical Biology B	5	B/NB	137
07-MS3BBB-261-m01	Biophysics and Biochemistry B	5	B/NB	143
07-MS2BTB-261-m01	Biophysics and Molecular Biotechnology B	5	NUM	106
07-MS1B-261-m01	Neurobiology, Behavioural Physiology and Animal Ecology B	7	B/NB	77
07-MNBB-261-m01	Neurogenetics of Behaviour B	5	B/NB	73
07-MENMNDB-261-m01	Neuromodulation and Neuronal Development B	5	B/NB	51
07-MECB-261-m01	Endogenous Clocks B	5	B/NB	49
07-MS1NFLSB-261-m01	Flying Senses B	5	B/NB	91
07-MGPN-261-m01	The Value of Nature	5	NUM	57
07-MCHÖKO-261-m01	Chemical Ecology	5	NUM	47
07-MTÖB-261-m01	Animal Ecology and Tropical Biology B	5	B/NB	189
07-MTÖ2B-261-m01	Animal Ecology and Tropical Biology 2 B	5	B/NB	188
07-MKB-261-m01	Animal Communication B	7	B/NB	61
07-MESB-261-m01	Experimental Sociobiology B	7	B/NB	52
07-MS2B-261-m01	Molecular Biology B	7	B/NB	101
07-MS2INF-B-261-m01	Infection Biology B	5	B/NB	117
07-MS2PA-B-261-m01	Pathogenicity of Microorganisms B	5	B/NB	121
07-MZE1-B-261-m01	Cell and Developmental Biology Master 1 B	3	B/NB	207
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07-MZE2-B-261-m01	Cell and Developmental Biology Master 2 B	3	B/NB	208
07-MSPARB-261-m01	Molecular Parasitology B	3	B/NB	181
07-MML-261-m01	Machine Learning in Bioinformatics	5	NUM	72
07-MALB-182-m01	Algorithmic Bioinformatics	5	NUM	44
07-MBI-B-261-m01	Bioinformatics B	5	B/NB	46
07-MS-B-261-m01	Systems Biology B	5	B/NB	170
03-MIM1-B-261-m01	Immunology 1 B	7	B/NB	21
03-MIM2-B-261-m01	Immunology 2 B	7	B/NB	23
03-MIM1-BS-261-m01	Immunology 1 BS	5	B/NB	22
03-MIM2-BS-261-m01	Immunology 2 BS	5	B/NB	24
03-MSMV-B-261-m01	Molecular Virology B	7	B/NB	28
03-98-SCB-192-m01	Single Cell Biology	5	NUM	20
07-MKEWO-152-m01	Nucleus Workshop	7	B/NB	62
07-MGRSD-152-m01	Gene Regulation and Signal Transduction	3	B/NB	58
07-MMBD-261-m01	Molecular Biodiversity Monitoring	5	NUM	69
07-MMIÖK-152-m01	Microbial Ecology	3	B/NB	71
07-MHWP-261-m01	Ecology of Honey Bees and Wild Bees	5	NUM	60
07-METI-261-m01	Ecology and Taxonomy of Insects	5	NUM	53
07-MMIE-261-m01	Modelling in Ecology	5	NUM	70
07-MAGRE-261-m01	Agroecology	5	NUM	43
07-MFEC-261-m01	Forest Ecology	5	NUM	54
07-MTROP-261-m01	Tropical Ecology	5	NUM	190
07-MSET-261-m01	Seminar Experimental Animal Ecology	2	B/NB	172
07-MPWD-261-m01	Presentation of Scientific Data	5	B/NB	75
07-MGLN-152-m01	Quality Assurance, Good Practice, Biosafety and Biosecurity	5	NUM	56
07-MGUG-261-m01	Brain and Mind	3	B/NB	59
07-MWIG-261-m01	Theory and History of Science	3	B/NB	206
07-MEMB-261-m01	Entrepreneurial Management in the Biosciences	10	B/NB	50
07-MUDB-261-m01	Entrepreneurial Thinking in the Biosciences	5	B/NB	192
07-MVMINT1-152-m01	Special Subject Studies Biology and Natural Sciences 1	2	B/NB	199
07-MVMINT2-261-m01	Special Subject Studies Biology and Natural Sciences 2	3	NUM	200
07-MVMINT2B-261-m01	Special Subject Studies Biology and Natural Sciences 2B	3	B/NB	201
07-MVMINT3-152-m01	Special Subject Studies Biology and Natural Sciences 3	4	B/NB	202
07-MVMINT4-261-m01	Special Subject Studies Biology and Natural Sciences 4	5	NUM	203
07-MVMINT4B-261-m01	Special Subject Studies Biology and Natural Sciences 4B	5	B/NB	204
07-MVMINT5-152-m01	Special Subject Studies Biology and Natural Sciences 5	6	B/NB	205
07-MV1-152-m01	Special Subject Studies outside Natural Sciences 1	2	B/NB	193
07-MV2-261-m01	Special Subject Studies outside Natural Sciences 2	3	NUM	194
07-MV2B-261-m01	Special Subject Studies outside Natural Sciences 2B	3	B/NB	195
07-MV3-152-m01	Special Subject Studies outside Natural Sciences 3	4	B/NB	196
07-MV4-261-m01	Special Subject Studies outside Natural Sciences 4	5	NUM	197
07-MV4B-261-m01	Special Subject Studies outside Natural Sciences 4B	5	B/NB	198
07-DR1-152-m01	Teaching 1	2	B/NB	36
07-DR2-152-m01	Teaching 2	3	B/NB	37
07-DR3-152-m01	Teaching 3	4	B/NB	38
07-DR4-152-m01	Teaching 4	5	B/NB	39

07-FT1-152-m01	Tutorial 1	3	B/NB	40
07-FT2-152-m01	Tutorial 2	4	B/NB	41
07-FT3-152-m01	Tutorial 3	5	B/NB	42
04-MRSÖ-261-m01	Remote Sensing in Ecology	5	NUM	35
07-MP-261-m01	Programming using Python	5	B/NB	74
07-MSOI-261-m01	Soil Ecology	5	NUM	179
07-MBEC-261-m01	Biodiversity, Ecosystem Services and Conservation	5	NUM	45
07-MMAC-261-m01	Macroecology	5	NUM	68
07-MGCB-261-m01	Global Change Biology	5	NUM	55
07-MSREC-261-m01	Statistics and R in Ecology and Conservation	5	NUM	184
07-MS1CBB-261-m01	Conservative Biology B	5	B/NB	79
07-MEAE-261-m01	Ecology of Alpine Environments	5	NUM	48
Thesis (30 ECTS credits)				
07-MT-T-162-m01	Master Thesis Biosciences	25	NUM	191
07-MT-K-162-m01	Oral Examination Biosciences	5	NUM	187

Module title		Abbreviation
Single Cell Biology		03-98-SCB-192-m01
Module coordinator		Module offered by
Helmholtz Institute of RNA-based Infection Research Würzburg		Faculty of Medicine
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	graduate	--
Contents		
The Single Cell Biology course is at the interface of genomics, bioinformatics, biology and pathology. It will give an introduction of the most recent technologies for single cell analysis and an overview of the application of single cell biology across the medical field (cancer, immunology, cardiovascular diseases, and infectious diseases). Practical components will allow the students to be familiarized with the basic tools to perform data analysis.		
Intended learning outcomes		
Students are familiar with fundamental concepts of single cell biology throughout the life sciences and they can apply basic procedures to analyze single cell data sets. They recognize the significance and areas of application of the methods for medical diagnostics and translational research.		
Courses (type, number of weekly contact hours, language — if other than German)		
V (1.5) + Ü (0.5) Module taught in: English		
Method of assessment (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. 60 minutes) Language of assessment: English creditable for bonus		
Allocation of places		
M.Sc.Biomed: 15 M.Sc. Biochem: 15 M.Sc. Biowis: 10 Selection process: allocation by lot		
Additional information		
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Workload		
150 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Immunology 1 B		03-MIM1-B-261-m01
Module coordinator		Module offered by
Managing Director of the Institute of Virology and Immunobiology		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	Cannot be combined with 07-MS2IM1.
Contents		
Foundations of molecular and cellular immunology as well as infection biology which allow a deeper understanding of immune-mediated defence mechanisms against infectious diseases. For more information, please visit http://www.virologie.uni-wuerzburg.de/lehveranstaltungen/vorlesungen_und_praktika/immunologie/immunologie_biologie_master/ .		
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 (1) + S (2) Module taught in: English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English Assessment offered: Winter semester only		
Allocation of places		
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Additional information		
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Workload		
210 h		
Teaching cycle		
Teaching cycle: Winter semester only		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Immunology 1 BS		03-MIM1-BS-261-m01
Module coordinator		Module offered by
Managing Director of the Institute of Virology and Immunobiology		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	Cannot be combined with 07-MS2IM1.
Contents		
Foundations of molecular and cellular immunology as well as infection biology which allow a deeper understanding of immune-mediated defence mechanisms against infectious diseases. For more information, please visit http://www.virologie.uni-wuerzburg.de/lehveranstaltungen/vorlesungen_und_praktika/immunologie/immunologie_biologie_master/ .		
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 (2) Module taught in: English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English Assessment offered: Winter semester only		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
Teaching cycle: Winter semester only		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Immunology 2 B		03-MIM2-B-261-m01
Module coordinator		Module offered by
Managing Director of the Institute of Virology and Immunobiology		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	Cannot be combined with 07-MS2IM2.
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.		
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)		
V (1) + S (2) Module taught in: English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English Assessment offered: Summer semester only		
Allocation of places		
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Additional information		
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Workload		
210 h		
Teaching cycle		
Teaching cycle: Summer semester only		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Immunology 2 BS		03-MIM2-BS-261-m01
Module coordinator		Module offered by
Managing Director of the Institute of Virology and Immunobiology		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	Cannot be combined with 07-MS2IM2.
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.		
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 (2) Module taught in: English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English Assessment offered: Summer semester only		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
Teaching cycle: Summer semester only		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title			Abbreviation
Clinical Virology for Biosciences			03-MSKVir-261-m01
Module coordinator		Module offered by	
--		Faculty of Medicine	
ECTS	Method of grading	Only after succ. compl. of module(s)	
5	numerical grade	--	
Duration	Module level	Other prerequisites	
1 semester	--	--	
Contents			
No information on contents available.			
Intended learning outcomes			
No information on intended learning outcomes available.			
Courses (type, number of weekly contact hours, language — if other than German)			
V (2) Module taught in: German and/or English			
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English			
Allocation of places			
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Additional information			
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Workload			
150 h			
Teaching cycle			
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Referred to in LPO I (examination regulations for teaching-degree programmes)			
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Module title		Abbreviation
Molecular Techniques		03-MSMT-252-m01
Module coordinator		Module offered by
degree programme coordinator Biologie (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 as well as methods for scientific investigation.		
Intended learning outcomes		
Students are able to apply molecular techniques and methods as well as to integrate these into experimental strategies and experimental set-ups to answer scientific questions.		
Courses (type, number of weekly contact hours, language — if other than German)		
S (3) Module taught in: English		
Method of assessment (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, open questions as well as multiple choice) or b) log (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Examination type, duration, and scope of the examination are announced at the beginning of the course. Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
90 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Molecular Virology		03-MSMV-261-m01
Module coordinator		Module offered by
--		Faculty of Medicine
ECTS	Method of grading	Only after succ. compl. of module(s)
10	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	--	Cannot be combined with 03-MSMV-B.
Contents		
No information on contents available.		
Intended learning outcomes		
No information on intended learning outcomes available.		
Courses (type, number of weekly contact hours, language — if other than German)		
V (1) + S (2) Module taught in: German and/or English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Molecular Virology B		03-MSMV-B-261-m01
Module coordinator		Module offered by
--		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	--	Cannot be combined with 03-MSMV.
Contents		
No information on contents available.		
Intended learning outcomes		
No information on intended learning outcomes available.		
Courses (type, number of weekly contact hours, language — if other than German)		
V (1) + S (2) Module taught in: German and/or English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
210 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Molecular Virology F1		03-MSMVF1-261-m01
Module coordinator		Module offered by
--		Faculty of Medicine
ECTS	Method of grading	Only after succ. compl. of module(s)
10	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	--	--
Contents		
No information on contents available.		
Intended learning outcomes		
No information on intended learning outcomes available.		
Courses (type, number of weekly contact hours, language — if other than German)		
P (14) + S (1) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) The examination is basically conducted in the form of examination variant b) protocol (standard case); alternative forms of examination remain reserved. Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title			Abbreviation
Molecular Virology F2			03-MSMVF2-261-m01
Module coordinator		Module offered by	
--		Faculty of Medicine	
ECTS	Method of grading	Only after succ. compl. of module(s)	
15	(not) successfully completed	--	
Duration	Module level	Other prerequisites	
1 semester	--	--	
Contents			
No information on contents available.			
Intended learning outcomes			
No information on intended learning outcomes available.			
Courses (type, number of weekly contact hours, language — if other than German)			
P (29) + S (1) Module taught in: German and/or English			
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English			
Allocation of places			
--			
Additional information			
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Workload			
450 h			
Teaching cycle			
--			
Referred to in LPO I (examination regulations for teaching-degree programmes)			
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Module title			Abbreviation
Tissue Engineering			03-MSTE-261-m01
Module coordinator		Module offered by	
--		Faculty of Medicine	
ECTS	Method of grading	Only after succ. compl. of module(s)	
10	numerical grade	--	
Duration	Module level	Other prerequisites	
1 semester	--	--	
Contents			
No information on contents available.			
Intended learning outcomes			
No information on intended learning outcomes available.			
Courses (type, number of weekly contact hours, language — if other than German)			
V (1) + S (2) Module taught in: German and/or English			
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English			
Allocation of places			
--			
Additional information			
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Workload			
300 h			
Teaching cycle			
--			
Referred to in LPO I (examination regulations for teaching-degree programmes)			
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Module title			Abbreviation
Tissue engineering as alternative for animal testing			03-MSTEAT-261-m01
Module coordinator		Module offered by	
--		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	--	--	
Contents			
No information on contents available.			
Intended learning outcomes			
No information on intended learning outcomes available.			
Courses (type, number of weekly contact hours, language — if other than German)			
S (1) + V (1) Module taught in: German and/or English			
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English			
Allocation of places			
--			
Additional information			
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Workload			
150 h			
Teaching cycle			
--			
Referred to in LPO I (examination regulations for teaching-degree programmes)			
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Module title			Abbreviation
Tissue engineering and regenerative Medicine F1			03-MSTEF1-261-m01
Module coordinator		Module offered by	
--		Faculty of Medicine	
ECTS	Method of grading	Only after succ. compl. of module(s)	
10	numerical grade	--	
Duration	Module level	Other prerequisites	
1 semester	--	--	
Contents			
No information on contents available.			
Intended learning outcomes			
No information on intended learning outcomes available.			
Courses (type, number of weekly contact hours, language — if other than German)			
P (14) + S (1) Module taught in: German and/or English			
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) The examination is basically conducted in the form of examination variant b) protocol (standard case); alternative forms of examination remain reserved. Language of assessment: German and/or English			
Allocation of places			
--			
Additional information			
--			
Workload			
300 h			
Teaching cycle			
--			
Referred to in LPO I (examination regulations for teaching-degree programmes)			
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Module title			Abbreviation
Tissue engineering and regenerative Medicine F2			03-MSTEF2-261-m01
Module coordinator		Module offered by	
--		Faculty of Medicine	
ECTS	Method of grading	Only after succ. compl. of module(s)	
15	(not) successfully completed	--	
Duration	Module level	Other prerequisites	
1 semester	--	--	
Contents			
No information on contents available.			
Intended learning outcomes			
No information on intended learning outcomes available.			
Courses (type, number of weekly contact hours, language — if other than German)			
P (29) + S (1) Module taught in: German and/or English			
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English			
Allocation of places			
--			
Additional information			
--			
Workload			
450 h			
Teaching cycle			
--			
Referred to in LPO I (examination regulations for teaching-degree programmes)			
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Module title			Abbreviation
Remote Sensing in Ecology			o4-MRSÖ-261-mo1
Module coordinator		Module offered by	
--		Faculty of Biology	
ECTS	Method of grading	Only after succ. compl. of module(s)	
5	numerical grade	--	
Duration	Module level	Other prerequisites	
1 semester	--	--	
Contents			
--			
Intended learning outcomes			
--			
Courses (type, number of weekly contact hours, language — if other than German)			
Ü (5) Module taught in: German and/or English			
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English			
Allocation of places			
--			
Additional information			
--			
Workload			
150 h			
Teaching cycle			
--			
Referred to in LPO I (examination regulations for teaching-degree programmes)			
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Module title		Abbreviation
Teaching 1		07-DR1-152-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	undergraduate	Please consult with course advisory service in advance.
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)		
S (2) Module taught in: German and/or English Course type: might also be offered in V, Ü, P, R or E format		
Method of assessment (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 Language of assessment: German and/or English		
Allocation of places		
--		
Additional information		
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Workload		
60 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Teaching 2		07-DR2-152-m01
Module coordinator		Module offered by
degree programme coordinator Biologie (Biology)		Faculty of Biology
ECTS	Method of grading	Only after succ. compl. of module(s)
3	(not) successfully completed	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Please consult with course advisory service in advance.
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 courses.		
Courses (type, number of weekly contact hours, language — if other than German)		
S (2) Module taught in: German and/or English Course type: might also be offered in V, Ü, P, R or E format		
Method of assessment (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 Language of assessment: German and/or English		
Allocation of places		
--		
Additional information		
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Workload		
90 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Teaching 3		07-DR3-152-m01
Module coordinator		Module offered by
degree programme coordinator Biologie (Biology)		Faculty of Biology
ECTS	Method of grading	Only after succ. compl. of module(s)
4	(not) successfully completed	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Please consult with course advisory service in advance.
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 courses.		
Courses (type, number of weekly contact hours, language — if other than German)		
S (2) Module taught in: German and/or English Course type: might also be offered in V, Ü, P, R or E format		
Method of assessment (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 Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
120 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Teaching 4		07-DR4-152-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	undergraduate	Please consult with course advisory service in advance.
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 courses.		
Courses (type, number of weekly contact hours, language — if other than German)		
S (3) Module taught in: German and/or English Course type: might also be offered in V, Ü, P, R or E format		
Method of assessment (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 Language of assessment: German and/or English		
Allocation of places		
--		
Additional information		
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Workload		
150 h		
Teaching cycle		
--		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Tutorial 1		07-FT1-152-m01
Module coordinator		Module offered by
degree programme coordinator Biologie (Biology)		Faculty of Biology
ECTS	Method of grading	Only after succ. compl. of module(s)
3	(not) successfully completed	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Please consult with course advisory service in advance.
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 (2) Module taught in: German and/or English		
Method of assessment (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 Language of assessment: German and/or English		
Allocation of places		
--		
Additional information		
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Workload		
90 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Tutorial 2		07-FT2-152-m01
Module coordinator		Module offered by
degree programme coordinator Biologie (Biology)		Faculty of Biology
ECTS	Method of grading	Only after succ. compl. of module(s)
4	(not) successfully completed	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Please consult with course advisory service in advance.
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 (2) Module taught in: German and/or English		
Method of assessment (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 Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
120 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Tutorial 3		07-FT3-152-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	undergraduate	Please consult with course advisory service in advance.
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 (3) Module taught in: German and/or English		
Method of assessment (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 Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Agroecology		07-MAGRE-261-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		
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 (3) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Algorithmic Bioinformatics		07-MALB-182-m01
Module coordinator		Module offered by
holder of the Chair of Bioinformatics		Faculty of Biology
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	graduate	--
Contents		
During this lecture we will learn advanced statistical and algorithmic methods of bioinformatics including practical examples and training.		
Intended learning outcomes		
Statistical and algorithmic approaches to deal with complex problems in bioinformatics.		
Courses (type, number of weekly contact hours, language — if other than German)		
Ü (4) Module taught in: German and/or English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Language of assessment: German and/or English Students will be informed about the method, length and scope of the assessment prior to the course.		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Biodiversity, Ecosystem Services and Conservation		07-MBEC-261-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		
This course will be held as a block-course in which students will use publicly available (spatial) data to develop and evaluate scenarios of landscape development or management. A selection of methods relevant for planning in conservation contexts such as monitoring tools, landscape mapping, natural capital valuation and others will be introduced. The students select a conservation-relevant topic, identify different perspectives or conflicts of interest in the context of sustainability, select and apply the appropriate tools. The students analyse the data, present the results and discuss them among their peers.		
Intended learning outcomes		
At the end of the module, students will be able to select appropriate monitoring methods, use spatial and non-spatial data in a planning context and statistically evaluate and critically discuss data related to conservation.		
Courses (type, number of weekly contact hours, language — if other than German)		
Ü (5) Module taught in: English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: English		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
Teaching cycle: Once a year, winter semester		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Bioinformatics B		07-MBI-B-261-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	Cannot be combined with 07-MS2Bl.
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 (2) Module taught in: German and/or English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Chemical Ecology		07-MCHÖKO-261-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		
The students will be deeply introduced into the chemical interaction of organisms with their biotic and abiotic environment with a focus on evolutionary and ecological research questions. You will learn adequate biological methods to study these interactions as well as analytical methods to characterize the substances used by the organisms. The aim of the course is to lead you to up-to-date topics in the field of chemical ecology.		
Intended learning outcomes		
Students will learn the basics in chemical ecology and will be taught to plan and conduct own experiments.		
Courses (type, number of weekly contact hours, language — if other than German)		
Ü (3) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Ecology of Alpine Environments		07-MEAE-261-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		
This practical block-course is mainly conducted in the German Alps and include field trips to the different ecosystems along elevational gradients, encompassing colline to subnival elevations. After exploring the habitat characteristics in different elevational belts, students will develop their own small research project focusing on the patterns and drivers of species diversity, species traits, animal-plant-interactions and/or animal-related ecosystem functions along climate- and land-use gradients. Throughout the course, they will learn the fundamentals of a sound research design and go through the steps of scientific work, including planning, conducting standardized experiments, and analyzing, interpreting, and presenting data to a (non-/) scientific community with critical discussion. In an integrated seminar students will learn about the importance of mountain ecosystem research in the context of climate change and for the UN Sustainable Development Goals.		
Intended learning outcomes		
At the end of the module, students can characterize habitats of different elevational belts and can explain the importance of mountains in climate protection and for achieving the UN Sustainable Development Goals. They know the fundamentals of a good study design and can apply different methods to record diversity, interactions, ecosystem functions and explanatory environmental parameters. They are able to evaluate and interpret data collected from climate and land use gradients in a statistically meaningful way and present and defend them in front of a broader audience.		
Courses (type, number of weekly contact hours, language — if other than German)		
Ü (3) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
Teaching cycle: summer semester		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Endogenous Clocks B		07-MECB-261-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	Cannot be combined with 07-MS1CB.
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 (2) Module taught in: English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Entrepreneurial Management in the Biosciences		07-MEMB-261-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)		
S (2) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Neuromodulation and Neuronal Development B		07-MENMNDB-261-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	Cannot be combined with 07-MS1NMND.
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 (3) Module taught in: English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Experimental Sociobiology B		07-MESB-261-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	Cannot be combined with 07-MS1ES.
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)		
V (2) + S (1) Module taught in: English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
210 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Ecology and Taxonomy of Insects		07-METI-261-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		
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 (5) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Forest Ecology		07-MFEC-261-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		
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 (3) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Global Change Biology		07-MGCB-261-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		
This block course provides students with a profound overview of the impacts of global change on biological systems, in the context of the global debate on sustainability. Using literature, media and data analyses as well as field trips and modelling, the significance of various anthropogenic influences (e.g. climate and land use change, pollution, invasive species) on species and ecosystems is examined. In interactive and interdisciplinary formats (e.g. expert discussions, role plays), the students will deepen what has been learned and options for action as well as sustainability concepts will be developed and discussed. Results are presented in a short poster presentation and discussed in an oral group examination.		
Intended learning outcomes		
At the end of the course, students will have a sound understanding of the situation of biological systems in the age of the Anthropocene as well as of the status of the global sustainability goals. They can apply analytical methods of global change ecology and evaluate the context-dependent importance of different drivers of global change. The students can develop options for action and discuss and evaluate their technical, political and social challenges in a differentiating manner.		
Courses (type, number of weekly contact hours, language — if other than German)		
Ü (5) Module taught in: English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: English		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
Teaching cycle: Once a year, summer semester		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Quality Assurance, Good Practice, Biosafety and Biosecurity		07-MGLN-152-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		
Basic Rules of Good Practice in the Life Sciences including laboratory, manufacturing, clinical and manufacturing practices. DIN en iso 9000-9004 standards, environmental protection and Biological safety and security / dual use criteria. Management concepts in the Biosciences.		
Intended learning outcomes		
The students are aware of several regulations and standards in the Life Sciences field and are aware of Quality standards in the Bioscientific context. Furthermore, they deal with management concepts in the field of science, environmental context and industry.		
Courses (type, number of weekly contact hours, language — if other than German)		
V (1) + S (1) Module taught in: German and/or English		
Method of assessment (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) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
Teaching cycle: summer semester		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
The Value of Nature		07-MGPN-261-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		
In this course students will be provided with basic information on threats to biodiversity and ecosystem services as well as the economic dimension of their loss. Students discuss different methods on how to evaluate the monetary values of biodiversity and ecosystem services and will be presented different examples on how ecosystem services can generate financial revenues. In addition we will discuss new, market-based approaches on the protection of biodiversity and ecosystem service.		
Intended learning outcomes		
Students gain insight in the complex of problems of biodiversity loss and the economic consequences coming along with this development. They are familiar with the current monetary evaluation methods, studies, initiatives (from politics, businesses, and society) and economic approaches aiming to solve the occurring problems; and are able to participate in current discussions on the topic in a competent way.		
Courses (type, number of weekly contact hours, language — if other than German)		
Ü (3) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Gene Regulation and Signal Transduction		07-MGRSD-152-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		
The lecture will discuss aspects covered in the lecture <i>Molekulare Biologie</i> (<i>Molecular Biology</i> , course no. 0610200) and in the special lecture <i>Mikrobiologie/Infektionsbiologie</i> (<i>Microbiology/Infection Biology</i> , course no. 0610220) in more detail and will explore some additional aspects.		
Courses (type, number of weekly contact hours, language — if other than German)		
V (1) Module taught in: German and/or English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
90 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Brain and Mind		07-MGUG-261-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 (2) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
90 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Ecology of Honey Bees and Wild Bees		07-MHWP-261-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		
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 (5) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Animal Communication B		07-MKB-261-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	Cannot be combined with 07-MS1K.
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 (2) + S (1) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
210 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Nucleus Workshop		07-MKEWO-152-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 (5) + V (1) Module taught in: German and/or English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
210 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Linux and Perl		07-ML-261-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 (3) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Methods in Life Sciences		07-MLS1-261-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	Cannot be combined with 07-MLS1B.
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 (3) Module taught in: English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Language of assessment: English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Methods in Life Sciences B		07-MLS1B-261-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	Cannot be combined with 07-MLS1.
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 (3) Module taught in: English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Language of assessment: English		
Allocation of places		
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Additional information		
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Workload		
210 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Topics and Concepts in Life Sciences		07-MLS2-261-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	Cannot be combined with 07-MLS2B.
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 (3) Module taught in: English		
Method of assessment (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 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) Language of assessment: English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Topics and Concepts in Life Sciences B		07-MLS2B-261-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	Cannot be combined with 07-MLS2.
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 (3) Module taught in: English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Language of assessment: English		
Allocation of places		
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Additional information		
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Workload		
210 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Macroecology		07-MMAC-261-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		
This block course provides students with an introduction to macroecology (which deals with patterns and processes of biological diversity at large spatial and temporal scales) and, in particular, practical knowledge and skills of macroecological research. Using prepared (bio)geographic and ecological data, students will analyze large-scale biodiversity patterns, the influence of abiotic factors on species distributions and species richness, and potential conservation applications. In individual projects students will apply the learned methodological approaches, the results are presented and discussed in a presentation and a protocol. Seminar discussions on classical and current macroecological literature will complete the course.		
Intended learning outcomes		
At the end of the course, students will have an in-depth understanding of macroecological research approaches. They will be able to analyze large-scale spatio-temporal variation in biological diversity in the context of ambient environmental conditions and evaluate the results from a conservation perspective. Students will be able to apply statistical methods to investigate macroecological data and to critically evaluate the possibilities and limitations of macroecological methods.		
Courses (type, number of weekly contact hours, language — if other than German)		
Ü (5) Module taught in: English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: English		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
Teaching cycle: Once a year, winter semester		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Molecular Biodiversity Monitoring		07-MMBD-261-m01
Module coordinator		Module offered by
holder of the Chair of Conservation Biology and Forest Ecology		Faculty of Biology
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	graduate	--
Contents		
Molecular methods are being increasingly used in ecological research. This module uses practical experience to introduce students to molecular methods that are currently being applied in biodiversity monitoring and other ecological research questions. The students learn how to plan and implement current molecular methods, such as DNA metabarcoding. They also learn how to use bioinformatics and statistics to process and analyse the resulting data. At the end of the module, the students present and discuss their findings in a scientific way.		
Intended learning outcomes		
Students are qualified to recognize which research questions can be answered using molecular methods, as well as the limitations of the instructed methods. They can correctly and safely apply the methods in research situations and can understand, process, analyse and present the resulting data. They are capable of working in a molecular laboratory and can mitigate the risk of sample contamination.		
Courses (type, number of weekly contact hours, language — if other than German)		
Ü (5) Module taught in: English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: English		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
Teaching cycle: only in winter semester		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Modelling in Ecology		07-MMIE-261-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		
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 (5) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Microbial Ecology		07-MMIÖK-152-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 discusses fundamental principles of the interaction of bacteria with their environment. A major emphasis is 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 and their evolution.		
Intended learning outcomes		
Students understand the fundamental principles and evolution of the mechanisms of interaction between bacteria and eukaryotic host organisms.		
Courses (type, number of weekly contact hours, language — if other than German)		
V (1) Module taught in: German and/or English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
90 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Machine Learning in Bioinformatics		07-MML-261-m01
Module coordinator		Module offered by
holder of the Chair of Bioinformatics		Faculty of Biology
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	graduate	--
Contents		
Machine learning are powerful computational methods with numerous application in bioinformatics. In this seminar we shed light on several different machine learning approaches and discuss how they help to answer biological questions.		
Intended learning outcomes		
Knowledge about the different concepts and techniques of machine learning and big data analysis as well as the competence to apply this for solving bioinformatical questions.		
Courses (type, number of weekly contact hours, language — if other than German)		
V (1) + Ü (3) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Neurogenetics of Behaviour B		07-MNBB-261-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	Cannot be combined with 07-MS1NB.
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 <i>Drosophila</i> , the mouse, and the nematode <i>C. elegans</i> .		
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 (3) Module taught in: English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Programming using Python		07-MP-261-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	--	--
Contents		
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Intended learning outcomes		
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Courses (type, number of weekly contact hours, language — if other than German)		
S (3) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Presentation of Scientific Data		07-MPWD-261-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 (2) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Neurobiology, Behavioural Physiology and Animal Ecology		07-MS1-261-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	Cannot be combined with 07-MS1B.
Contents		
Timing matters: Temporal organisation in the animal kingdom. Timing plays an important role in all living systems. Animals make use of endogenous clocks to predict and adapt to daily or seasonal changes in environmental parameters. To be at the right place at the right time is of great fitness relevance if -for example- a mating partner or enough food has to be found. Many mutualistic, antagonistic or social interactions can only take place if animals are at the same place at the same time and in the appropriate developmental stage. The lecture gives an introduction to the mechanisms underlying the temporal organisation in the animal kingdom. Adopting an integrative approach, the lecture goes from timing mechanisms on the neuronal level to individual behaviour and then to interactions in social groups, populations or partners in complex and variable ecosystems.		
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. In the seminar, students practise the discussion of research findings.		
Courses (type, number of weekly contact hours, language — if other than German)		
V (3) Module taught in: English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Neurobiology, Behavioural Physiology and Animal Ecology B		07-MS1B-261-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)
7	(not) successfully completed	--
Duration	Module level	Other prerequisites
1 semester	graduate	Cannot be combined with 07-MS1.
Contents		
Timing matters: Temporal organisation in the animal kingdom. Timing plays an important role in all living systems. Animals make use of endogenous clocks to predict and adapt to daily or seasonal changes in environmental parameters. To be at the right place at the right time is of great fitness relevance if -for example- a mating partner or enough food has to be found. Many mutualistic, antagonistic or social interactions can only take place if animals are at the same place at the same time and in the appropriate developmental stage. The lecture gives an introduction to the mechanisms underlying the temporal organisation in the animal kingdom. Adopting an integrative approach, the lecture goes from timing mechanisms on the neuronal level to individual behaviour and then to interactions in social groups, populations or partners in complex and variable ecosystems.		
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 (3) Module taught in: English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
210 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Endogenous Clocks		07-MS1CB-261-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	Cannot be combined with 07-MECB.
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 (2) + S (1) Module taught in: English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Conservative Biology B		07-MS1CBB-261-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	Cannot be combined with 07-MS1CONS.
Contents		
The lecture focusses on the essentials in conservation biology and the causes of global change for organisms and ecosystems. Nature conservation relevant topics from theory to application will be a main focus. The lecture will usually be held in English. The lecture focusses on the essentials in conservation biology and the causes of global change for organisms and ecosystems. Nature conservation relevant topics from theory to application will be a main focus. The lecture will usually be held in English.		
Intended learning outcomes		
The students are qualified to work on topics in conservation biology and to assess their importance for humans. They are competent to assess consequences of human interventions and to formulate research questions relevant to nature conservation. The students are able to design knowledge-based national and international measures in nature conservation in a practical way. They also acquire a sound knowledge of a broad range of topics in conservation biology and ecology.		
Courses (type, number of weekly contact hours, language — if other than German)		
V (2) Module taught in: German and/or English		
Method of assessment (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) protocol (approx. 15 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 (30 to 60 minutes) or e) presentation (approx. 20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
Teaching cycle: once a year, winter semester		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title			Abbreviation
Conservation Biology F1			07-MS1CBF1-261-m01
Module coordinator		Module offered by	
--		Faculty of Biology	
ECTS	Method of grading	Only after succ. compl. of module(s)	
10	numerical grade	--	
Duration	Module level	Other prerequisites	
1 semester	--	--	
Contents			
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Intended learning outcomes			
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Courses (type, number of weekly contact hours, language — if other than German)			
P (14) + S (1) Module taught in: German and/or English			
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) The examination is basically conducted in the form of examination variant b) protocol (standard case); alternative forms of examination remain reserved. Language of assessment: German and/or English			
Allocation of places			
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Additional information			
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Workload			
300 h			
Teaching cycle			
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Referred to in LPO I (examination regulations for teaching-degree programmes)			
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Module title		Abbreviation
Conservation Biology F2		07-MS1CBF2-261-m01
Module coordinator		Module offered by
--		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	--	--
Contents		
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Intended learning outcomes		
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Courses (type, number of weekly contact hours, language — if other than German)		
P (29) + S (1) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
450 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Conservation Biology		07-MS1CONS-261-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	Cannot be combined with 07-MS1CBB.
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)		
V (2) + S (1) Module taught in: German and/or English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Experimental Sociobiology		07-MS1ES-261-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	Cannot be combined with 07-MESB.
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 (2) + S (1) Module taught in: English		
Method of assessment (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, open questions as well as multiple choice) or b) log (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Animal Communication		07-MS1K-261-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	Cannot be combined with 07-MKB.
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)		
V (2) + S (1) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Molecular and Clinical Neurobiology		07-MS1N-152-m01
Module coordinator		Module offered by
Managing Director of the Institute of Clinical Neurobiology		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 <i>Molekulare und klinische Neurobiologie (Molecular and Clinical Neurobiology)</i> - 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 <i>Neuroentwicklungsbiologie (Neurodevelopment; Fridays 8-9 a. m.)</i> 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)		
V (2) + S (1) Module taught in: German and/or English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Neurogenetics of Behaviour		07-MS1NB-261-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	Cannot be combined with 07-MNBB.
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 <i>Drosophila</i> , the mouse, and the nematode <i>C. elegans</i> .		
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 (2) + S (1) Module taught in: English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Developmental Neurobiology and Chronobiology		07-MS1NEC-152-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 <i>Endogenous Clocks</i>: 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 <i>Neuronal Development</i>: 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 (2) + S (1) Module taught in: English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Students will be informed about the method, length and scope of the assessment prior to the course. Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Neurobiology F1		07-MS1NF1-261-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, immuno-histochemistry, 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)		
P (14) + S (1) Module taught in: German and/or English		
Method of assessment (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, open questions as well as multiple choice) or b) log (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) The examination is basically conducted in the form of examination variant b) protocol (standard case); alternative forms of examination remain reserved. Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Neurobiology F2		07-MS1NF2-261-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)		
P (29) + S (1) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
450 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Flying Senses		07-MS1NFLS-261-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	Cannot be combined with 07-MS1NFLSB.
Contents		
This module examines the anatomical and neurophysiological basis of various sensory perceptions. A comparison is drawn between the sensory systems of invertebrates, particularly insects, and vertebrates. Particular attention is paid to the specific adaptations and specializations that insects have developed to suit their respective environmental conditions and ecological niches. A focus is placed on flying insects such as mosquitoes, moths, and flies. It examines how these animals detect sensory stimuli, how these stimuli are neurally processed, and how behaviors arise from this. The focus is on the following sensory modalities: olfaction and taste, touch, vibration, hearing, vision, heat, and the electrical and magnetic senses. The goal is to understand the complex relationships between sensory perception, neural processing, and behavior.		
Intended learning outcomes		
Students will acquire knowledge of the general principles of the function of sensory systems and learn about the similarities and differences between these systems in invertebrates and vertebrates. They will also gain a substantive and methodological insight into current research topics in sensory physiology and neurobehavioral research. The seminar will provide practice in presenting and discussing scientific results in English.		
Courses (type, number of weekly contact hours, language — if other than German)		
V (2) + S (1) Module taught in: English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
Teaching cycle: every year, winter semester		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Flying Senses B		07-MS1NFLSB-261-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	Cannot be combined with 07-MS1NFLS.
Contents		
This module examines the anatomical and neurophysiological basis of various sensory perceptions. A comparison is drawn between the sensory systems of invertebrates, particularly insects, and vertebrates. Particular attention is paid to the specific adaptations and specializations that insects have developed to suit their respective environmental conditions and ecological niches. A focus is placed on flying insects such as mosquitoes, moths, and flies. It examines how these animals detect sensory stimuli, how these stimuli are neuronally processed, and how behaviors arise from this. The focus is on the following sensory modalities: olfaction and taste, touch, vibration, hearing, vision, heat, and the electrical and magnetic senses. The goal is to understand the complex relationships between sensory perception, neural processing, and behavior.		
Intended learning outcomes		
Students will acquire knowledge of the general principles of the function of sensory systems and learn about the similarities and differences between these systems in invertebrates and vertebrates. They will also gain a substantive and methodological insight into current research topics in sensory physiology and neurobehavioral research.		
Courses (type, number of weekly contact hours, language — if other than German)		
V (2) Module taught in: English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
Teaching cycle: once a year, winter semester		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Neuromodulation and Neuronal Development		07-MS1NMND-261-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	Cannot be combined with 07-MENMNDB.
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. 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 (2) + S (1) Module taught in: English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Animal Ecology and Tropical Biology 2		07-MS1TÖ2-261-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	Cannot be combined with 07-MTÖ2B.
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 (2) + S (1) Module taught in: English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Animal Ecology and Tropical Biology		07-MS1TÖ-261-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	Cannot be combined with 07-MTÖB.
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)		
V (2) + S (1) Module taught in: German and/or English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Animal Ecology F1		07-MS1TÖF1-261-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 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)		
P (14) + S (1) Module taught in: German and/or English		
Method of assessment (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, open questions as well as multiple choice) or b) log (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) The examination is basically conducted in the form of examination variant b) protocol (standard case); alternative forms of examination remain reserved. Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module title		Abbreviation
Animal Ecology and Tropical Biology F2		07-MS1TÖF2-261-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	--
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)		
P (29) + S (1) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
450 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Behavioural Physiology and Sociobiology F1		07-MS1VF1-261-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		
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)		
P (14) + S (1) Module taught in: German and/or English		
Method of assessment (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, open questions as well as multiple choice) or b) log (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) The examination is basically conducted in the form of examination variant b) protocol (standard case); alternative forms of examination remain reserved. Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Behavioural Physiology and Sociobiology F2		07-MS1VF2-261-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	--
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)		
P (29) + S (1) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
450 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Molecular Biology		07-MS2-261-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	Cannot be combined with 07-MS2B.
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 (3) Module taught in: German and/or English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Molecular Biology B		07-MS2B-261-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)
7	(not) successfully completed	--
Duration	Module level	Other prerequisites
1 semester	graduate	Cannot be combined with 07-MS2.
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 (3) Module taught in: German and/or English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
210 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Bioinformatics		07-MS2BI-261-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	Cannot be combined with 07-MBI-B.
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 (2) + S (1) Module taught in: German and/or English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Bioinformatics F1		07-MS2BIF1-261-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)		
P (14) + S (1) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) The examination is basically conducted in the form of examination variant b) protocol (standard case); alternative forms of examination remain reserved. Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Bioinformatics F2		07-MS2BIF2-261-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	--
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)		
P (29) + S (1) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
450 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Biophysics and Molecular Biotechnology		07-MS2BT-261-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	Cannot be combined with 07-MS2BTB.
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 (2) + S (1) Module taught in: English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Biophysics and Molecular Biotechnology B		07-MS2BTB-261-m01
Module coordinator		Module offered by
holder of the Chair of Biotechnology and Biophysics		Faculty of Biology
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	graduate	Cannot be combined with 07-MS2BT.
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, electrokinetic techniques, 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 (2) Module taught in: English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Biophysics and Molecular Biotechnology F1		07-MS2BTF1-261-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)		
P (14) + S (1) Module taught in: German and/or English		
Method of assessment (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, open questions as well as multiple choice) or b) log (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) The examination is basically conducted in the form of examination variant b) protocol (standard case); alternative forms of examination remain reserved. Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Biophysics and Molecular Biotechnology F2		07-MS2BTF2-261-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	--
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 Master'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)		
P (29) + S (1) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
450 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Human Genetics		07-MS2HG-152-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)		
V (2) + S (1) Module taught in: German and/or English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Human Genetics F1		07-MS2HGF1-261-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)		
P (14) + S (1) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) The examination is basically conducted in the form of examination variant b) protocol (standard case); alternative forms of examination remain reserved. Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Human Genetics F2		07-MS2HGF2-261-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	--
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)		
P (29) + S (1) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
450 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Immunology 1		07-MS2IM1-261-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	Cannot be combined with 03-MIM1-B and 03-MIM1-BS.
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)		
V (1) + S (2) Module taught in: English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English Assessment offered: Winter semester only		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Immunology 2		07-MS2IM2-261-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	Cannot be combined with 03-MIM2-B and 03-MIM2-BS.
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)		
V (1) + S (2) Module taught in: English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English Assessment offered: Summer semester only		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Immunology F1		07-MS2IMF1-261-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)		
P (14) + S (1) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) The examination is basically conducted in the form of examination variant b) protocol (standard case); alternative forms of examination remain reserved. Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Immunology F2		07-MS2IMF2-261-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	--
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)		
P (29) + S (1) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
450 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Infection Biology		07-MS2INF-261-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	Cannot be combined with 07-MS2INF-B.
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 (2) + S (1) Module taught in: German and/or English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Infection Biology B		07-MS2INF-B-261-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	Cannot be combined with 07-MS2INF.
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 (2) Module taught in: German and/or English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Microbiology F1		07-MS2MF1-261-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		
Participants will work independently 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, cellular biology, and immunology as well as data analysis and literature research 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)		
P (14) + S (1) Module taught in: German and/or English		
Method of assessment (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, open questions as well as multiple choice) or b) log (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) The examination is basically conducted in the form of examination variant b) protocol (standard case); alternative forms of examination remain reserved. Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
Teaching cycle: Ongoing, after consultation with the supervisor and registration for both winter and summer semesters.		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Microbiology F2		07-MS2MF2-261-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	--
Contents		
Participants will work independently 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)		
P (29) + S (1) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
450 h		
Teaching cycle		
Teaching cycle: Ongoing, after consultation with the supervisor and registration for both winter and summer semesters.		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Pathogenicity of Microorganisms		07-MS2PA-261-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	Cannot be combined with 07-MS2PA-B.
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 (2) + S (1) Module taught in: English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Pathogenicity of Microorganisms B		07-MS2PA-B-261-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	Cannot be combined with 07-MS2PA.
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 (2) Module taught in: English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Molecular Parasitology F1		07-MS2PARF1-261-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 lecture Molecular Parasitology discusses molecular and genetic aspects of parasitic diseases in humans and animals. Special emphasis is on neglected tropical diseases. In the seminar "Molecular Parasitology," classic groundbreaking articles in parasitology are discussed and examined in an unusual way.		
Intended learning outcomes		
Participants possess a knowledge of the theoretical principles underlying parasitology and are able to put this into the broader context of molecular cell biology research.		
Courses (type, number of weekly contact hours, language — if other than German)		
P (14) + S (1) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) The examination is basically conducted in the form of examination variant b) protocol (standard case); alternative forms of examination remain reserved. Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
Teaching cycle: once a year, summer semester		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Molecular Parasitology F2		07-MS2PARF2-261-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	--
Contents		
The lecture Molecular Parasitology discusses molecular and genetic aspects of parasitic diseases in humans and animals. Special emphasis is on neglected tropical diseases.		
Intended learning outcomes		
Participants possess a knowledge of the theoretical principles underlying parasitology and are able to put this into the broader context of molecular cell biology research.		
Courses (type, number of weekly contact hours, language — if other than German)		
P (29) + S (1) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
450 h		
Teaching cycle		
Teaching cycle: once a year, summer semester		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Physiological Chemistry F2		07-MS2PHF2-261-m01
Module coordinator		Module offered by
holder of the Chair of Biochemistry and Molecular 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	--
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)		
P (29) + S (1) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
450 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Topics in Bioinformatics		07-MS2TBI-152-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. next generation sequences, proteomics data), analysis of different functional RNAs (e. g. miRNAs, lncRNAs).		
Intended learning outcomes		
Students are able to understand recent results in bioinformatics and discuss their implications. They have developed an advanced knowledge about typical techniques, scientific objectives and scientific questions.		
Courses (type, number of weekly contact hours, language — if other than German)		
V (2) + S (1) Module taught in: English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Students will be informed about the method, length and scope of the assessment prior to the course. Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Cell and Developmental Biology Master 1		07-MS2ZE1-261-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	Cannot be combined with 07-MZE1-B.
Contents		
The module consists of the lecture <i>Zellpathologie (Cytopathology)</i> and the seminar <i>Zellbiologie-Meilensteine und Perspektiven (Milestones and Perspectives of Cell Biology)</i> . 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 <i>Milestones and Perspectives of Cell Biology</i> , classic ground-breaking publications in the field of cell biology are discussed from an unusual point of view.		
Intended learning outcomes		
Students possess a knowledge of the theoretical principles underlying cell pathology 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 (1) + S (2) Module taught in: German and/or English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Cell and Developmental Biology Master 2		07-MS2ZE2-261-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	Cannot be combined with 07-MZE2-B.
Contents		
The module consists of the lecture <i>Signale und Differenzierung</i> (Signals and Differentiation) and the seminar <i>Entwicklungsbiologie - Meilensteine und Perspektiven</i> (Milestones and Perspectives of Developmental Biology). The lecture <i>Signals and Differentiation</i> does not attempt to impart pure textbook knowledge. Instead, historically important as well as particularly interesting and important trend-setting topics in developmental biology are presented. The topics range from classical developmental subjects such as tissue regeneration and morphogenetic cell migration to molecular stem cell biology, epigenetic plasticity, origins of multicellularity and development within changing environments. In the seminar <i>Milestones and Perspectives of Developmental Biology</i>, classic ground-breaking publications in the field of developmental biology are 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)		
V (1) + S (2) Module taught in: English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Cell and Developmental Biology F1		07-MS2ZEF1-261-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		
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. Large parts of this practical course are devoted to small projects, which should provide sustained insights into current research activities of the Chair. Interactions with Master's students, doctoral researchers and post-docs prepare participants for a working in a team-based environment.		
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)		
P (14) + S (1) Module taught in: German and/or English		
Method of assessment (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, open questions as well as multiple choice) or b) log (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) The examination is basically conducted in the form of examination variant b) protocol (standard case); alternative forms of examination remain reserved. Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Cell and Developmental Biology F2		07-MS2ZEF2-261-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	--
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 research group.		
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)		
P (29) + S (1) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
450 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Cellular Tumor Biology F1		07-MS2ZTF1-261-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	--
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 (14) + S (1) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) The examination is basically conducted in the form of examination variant b) protocol (standard case); alternative forms of examination remain reserved. Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Cellular Tumor Biology F2		07-MS2ZTF2-261-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	--
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 (29) + S (1) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
450 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Current Methods in Biology		07-MS31-261-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	Cannot be combined with 07-MS31B.
Contents		
This lecture series imparts the theoretical background of fundamental and up-to-date molecular biological methods in plant sciences. Special emphasis is placed on analytical tools, large-scale data analysis and their application.		
Intended learning outcomes		
At the end of the lecture series, students will (I) be able to qualitatively evaluate results acquired with analytical and molecular biological methods and to integrate them into the context of the current scientific knowledge in this field (II) have gained an overview of the advantages/disadvantages of analytical and molecular biological approaches (III) be able to apply the knowledge they have acquired to design their own experimental strategies for addressing a specific research question.		
Courses (type, number of weekly contact hours, language — if other than German)		
V (3) Module taught in: German and/or English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Current Methods in Biology B		07-MS31B-261-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	Cannot be combined with 07-MS31.
Contents		
This lecture series imparts the theoretical background of fundamental and up-to-date molecular biological methods in plant sciences. Special emphasis is placed on analytical tools, large-scale data analysis and their application.		
Intended learning outcomes		
At the end of the lecture series, students will (I) be able to qualitatively evaluate results acquired with analytical and molecular biological methods and to integrate them into the context of the current scientific knowledge in this field (II) have gained an overview of the advantages/disadvantages of analytical and molecular biological approaches (III) be able to apply the knowledge they have acquired to design their own experimental strategies for addressing a specific research question.		
Courses (type, number of weekly contact hours, language — if other than German)		
V (3) Module taught in: English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
210 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Molecular Plant Physiology F1		07-MS31MPPF1-261-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. The students will be integrated into research projects on current topics in molecular 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)		
P (14) + S (1) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) The examination is basically conducted in the form of examination variant b) protocol (standard case); alternative forms of examination remain reserved. Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Molecular Plant Physiology F2		07-MS31MPPF2-261-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	--
Contents		
The students perform their research work within the context of a current research project in molecular plant 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)		
P (29) + S (1) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
450 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title			Abbreviation
Plant Immunobiology and Pharmaceutical Biology			07-MS31PIP-261-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	Cannot be combined with 07-MS31PIPB.	
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			
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 (2) + S (1) Module taught in: German and/or English			
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Language of assessment: German and/or English			
Allocation of places			
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Additional information			
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Workload			
300 h			
Teaching cycle			
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Referred to in LPO I (examination regulations for teaching-degree programmes)			
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Module title		Abbreviation
Plant Immunobiology and Pharmaceutical Biology B		07-MS31PIPB-261-m01
Module coordinator		Module offered by
holder of the Chair of Pharmaceutical Biology		Faculty of Biology
ECTS	Method of grading	Only after succ. compl. of module(s)
5	(not) successfully completed	--
Duration	Module level	Other prerequisites
1 semester	graduate	Cannot be combined with 07-MS31PIP.
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		
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 (2) Module taught in: German and/or English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Plant Adaptations		07-MS31PLA-261-m01
Module coordinator		Module offered by
holder of the Chair of Ecophysiology (Botany II)		Faculty of Biology
ECTS	Method of grading	Only after succ. compl. of module(s)
10	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	graduate	Cannot be combined with 07-MS31PLAB.
Contents		
The module encompasses four sections with different foci. Students actively take part in all four sections. I) Kick-off meeting and Intro: In this meeting the seminar topics (see section IV), the dates for two excursions (see section III), and the exam will be scheduled. In the following two lectures, we will introduce general concepts of plant ecology. II) The second section introduces molecular aspects of plant ecology. For example, we outline the • genetic basis of natural variation, • physico-chemical basis of plant surface interactions with the environment, • physiological aspects of plant interactions with fungi and bacteria, • molecular regulation of plant root endosymbiosis, • genetic and physiological basis of nitrogen acquisition. III) The third section comprises lectures about the relationships between climate, soil, and vegetation. In addition, two excursions will introduce selected plant communities in the field. IV) In the fourth section, each student will present a scientific publication in a literature seminar (20 min. talk). All students are expected to actively participate in the associated discussions.		
Intended learning outcomes		
Students should acquire a deep understanding of the relationship between molecular regulation of adaptive capacity in plants, and its importance for the biotic and abiotic interactions of plants with environmental factors. They should acquire competence to identify plant adaptive strategies on a molecular as well as macroscopic level, and to interpret and critically discuss the relevance of plant adaptations, also with respect to the current climate change, in the context of the scientific state of knowledge.		
Courses (type, number of weekly contact hours, language — if other than German)		
V (2) + S (1) Module taught in: German and/or English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
Teaching cycle: summer semester		

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

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Module title		Abbreviation
Plant Adaptations B		07-MS31PLAB-261-m01
Module coordinator		Module offered by
holder of the Chair of Ecophysiology (Botany II)		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	Cannot be combined with 07-MS31PLA.
Contents		
The module encompasses a subset of three from four sections with different foci. I) Kick-off meeting and Intro: In this meeting the seminar topics (see section IV), the dates for two excursions (see section III), and the exam will be scheduled. Also, the selection will be discussed and assigned. In the following two lectures, we will introduce general concepts of plant ecology. II) The second section introduces molecular aspects of plant ecology. For example, we outline the • genetic basis of natural variation, • physico-chemical basis of plant surface interactions with the environment, • physiological aspects of plant interactions with fungi and bacteria, • molecular regulation of plant root endosymbiosis, • genetic and physiological basis of nitrogen acquisition. III) The third section comprises lectures about the relationships between climate, soil, and vegetation. In addition, two excursions will introduce selected plant communities in the field. IV) In the fourth section, each student will present a scientific publication in a literature seminar (20 min. talk). All students are expected to actively participate in the associated discussions. Section I is obligatory for all subsets. Additionally, students can select two of the sections II-IV: a) Lecture version (without seminar): sections I, II and III b) Molecular aspects of plant ecology and adaptation (with seminar): sections I, II and IV c) Macroscopic aspects of plant ecology and adaptation (with seminar): sections I, III and IV		
Intended learning outcomes		
Students should acquire a deep understanding of the relationship between molecular regulation of adaptive capacity in plants, and its importance for the biotic and abiotic interactions of plants with environmental factors. They should acquire competence to identify plant adaptive strategies on a molecular as well as macroscopic level, and to interpret and critically discuss the relevance of plant adaptations, also with respect to the current climate change, in the context of the scientific state of knowledge.		
Courses (type, number of weekly contact hours, language — if other than German)		
V (2) Module taught in: German and/or English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload
150 h
Teaching cycle
Teaching cycle: summer semester
Referred to in LPO I (examination regulations for teaching-degree programmes)
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Module title		Abbreviation
Biophysics and Biochemistry		07-MS3BB-261-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	Cannot be combined with 07-MS3BBB.
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 (2) + S (1) Module taught in: English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Biophysics and Biochemistry B		07-MS3BBB-261-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	Cannot be combined with 07-MS3BB.
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 (2) Module taught in: English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Biophysics of Plant Membrane Proteins F1		07-MS3BPF1-261-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 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)		
P (14) + S (1) Module taught in: German and/or English		
Method of assessment (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, open questions as well as multiple choice) or b) log (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) The examination is basically conducted in the form of examination variant b) protocol (standard case); alternative forms of examination remain reserved. Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Biophysics of Plant Membrane Proteins F2		07-MS3BPF2-261-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	--
Contents		
The students perform their research work within the context of a current research project on the biophysics of plant membrane proteins in a largely independent manner under supervision of a principal investigator.		
Intended learning outcomes		
The students are able to address scientific issues in biophysics, using appropriate biophysical methods. They are able to independently design the appropriate experiments as well as to analyse, document, present and discuss the results.		
Courses (type, number of weekly contact hours, language — if other than German)		
P (29) + S (1) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
450 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Biochemistry and Structural Biology F1		07-MS3BSBF1-261-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 in protein biochemistry and structural biology. The students will be integrated into research projects on current topics in 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)		
P (14) + S (1) Module taught in: German and/or English		
Method of assessment (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, open questions as well as multiple choice) or b) log (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) The examination is basically conducted in the form of examination variant b) protocol (standard case); alternative forms of examination remain reserved. Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Biochemistry and Structural Biology F2		07-MS3BSBF2-261-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	--
Contents		
The students perform their research work within the context of a current research project on 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)		
P (29) + S (1) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
450 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Computational Biology F1		07-MS3COBF1-261-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)		
P (14) + S (1) Module taught in: German and/or English		
Method of assessment (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, open questions as well as multiple choice) or b) log (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) The examination is basically conducted in the form of examination variant b) protocol (standard case); alternative forms of examination remain reserved. Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Computational Biology F2		07-MS3COBF2-261-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	--
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 successfully conduct scientific research (for their Master's thesis). Ability to independently address topics in bioinformatics as well as document and interpret findings, adhering to the principles of good scientific practice.		
Courses (type, number of weekly contact hours, language — if other than German)		
P (29) + S (1) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
450 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Genetics of Systemic Signalling in Plants F1		07-MS3GSSF1-261-m01
Module coordinator		Module offered by
holder of the chair of Plant Ecophysiology (Botany II)		Faculty of Biology
ECTS	Method of grading	Only after succ. compl. of module(s)
10	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	graduate	--
Contents		
In the context of current research, a project with focus on the genetic basis of signalling in plants as well as of plants with the biotic environment will be carried out. Working concepts will be designed and complex experiments will be performed. The experimental results will be presented and critically discussed by a presentation and a protocol. Students learn and deepen their knowledge on applying special methods in molecular biology, microscopy and quantitative analytic.		
Intended learning outcomes		
Students are qualified to plan and to perform scientific work in the field plant signalling according to the rules of Good Scientific Practice. They are able to document and critically discuss results of research and to present them to a professional audience. They are able to discuss the use of genetic engineering methods with respect to sustainability and acceptance in society.		
Courses (type, number of weekly contact hours, language — if other than German)		
P (14) + S (1) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) The examination is basically conducted in the form of examination variant b) protocol (standard case); alternative forms of examination remain reserved. Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
Teaching cycle: winter semester and summer semester		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Genetics of Systemic Signalling in Plants F2		07-MS3GSSF2-261-m01
Module coordinator		Module offered by
holder of the chair of Plant Ecophysiology (Botany II)		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		
In the context of current research, a project with focus on the genetic basis of signalling in plants as well as of plants with the biotic environment will be carried out. Working concepts will be designed and complex experiments will be performed. Students will do this work largely on their own responsibility by performing advanced experiments including documentation and evaluation. Based on the results obtained, the molecular, analytical and/or ecophysiological methods applied will be critically assessed and, where necessary, modified. The progress of the experiments and their contribution to more general projects will be documented and presented as presentations, publications or protocols. Students deepen their knowledge on the background of the scientific field and broaden their range of methodical skills in molecular biology, microscopy and/or ecophysiology.		
Intended learning outcomes		
Students are qualified to plan and to perform scientific work largely on their own responsibility. They are able to realise systematic biases and to adapt the approach according to the rules of Good Scientific Practice. They are able to critically discuss results of research and to present them to a professional audience. Students are enabled to form their own and well-founded opinion on the significance of genetic engineering methods with respect to sustainability and acceptance in society.		
Courses (type, number of weekly contact hours, language — if other than German)		
P (29) + S (1) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
450 h		
Teaching cycle		
Teaching cycle: winter semester and summer semester		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Molecular Plant-Microbe-Interactions F1		07-MS3MPMIF1-261-m01
Module coordinator		Module offered by
holder of the Chair of Ecophysiology (Botany II)		Faculty of Biology
ECTS	Method of grading	Only after succ. compl. of module(s)
10	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	graduate	--
Contents		
In the context of current research, a project alternatively with focus on the molecular regulation and communication mechanisms in bacteria or fungi/plant-interactions or on the genetic control of nitrogen foraging will be carried out. Working concepts will be designed and complex experiments will be performed. The experimental results will be presented and critically discussed by a presentation and a protocol. Students learn and deepen their knowledge on applying special methods in molecular biology, microscopy and ecophysiology.		
Intended learning outcomes		
Students are qualified to plan and to perform scientific work in the field plant interactions with microorganisms according to the rules of Good Scientific Practice. They are able to document, critically discuss results of research and to present them to a professional audience.		
Courses (type, number of weekly contact hours, language — if other than German)		
P (14) + S (1) Module taught in: German and/or English		
Method of assessment (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, open questions as well as multiple choice) or b) log (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) The examination is basically conducted in the form of examination variant b) protocol (standard case); alternative forms of examination remain reserved. Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
Teaching cycle: winter semester and summer semester		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Molecular Plant-Microbe-Interactions F2		07-MS3MPMIF2-261-m01
Module coordinator		Module offered by
holder of the Chair of Ecophysiology (Botany II)		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		
Students will work on projects taken from ongoing research alternatively with focus on the molecular regulation and communication mechanisms in bacteria or fungi/plant-interactions or on the genetic control of nitrogen foraging. They will do this work largely on their own responsibility by performing advanced experiments including documentation and evaluation. Based on the results obtained, the molecular, analytical and/or ecophysiological methods applied will be critically assessed and, where necessary, modified. The progress of the experiments and their contribution to more general projects will be documented and presented as presentations, publications or protocols. Students deepen their knowledge on the background of the scientific field and broaden their range of methodical skills in molecular biology, microscopy and ecophysiology.		
Intended learning outcomes		
Students are qualified to plan and to perform scientific work largely on their own responsibility. They are able to realise systematic biases and to adapt the approach according to the rules of Good Scientific Practice. They are able to critically discuss results of research and to present them to a professional audience.		
Courses (type, number of weekly contact hours, language — if other than German)		
P (29) + S (1) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
450 h		
Teaching cycle		
Teaching cycle: winter semester and summer semester		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Plant Chemical Biology and Metabolism F1		07-MS3PCBF1-261-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. In the chair of Pharmaceutical Biology, we apply metabolomics for gene function- or stress response analysis. Students can choose a topic from the diverse running projects. Depending on the scientific question of the research team at the department, the methodological approach involves techniques in the field of "Metabolite Analysis/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 are 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 designing, performing and critical evaluating scientific experiments and results as well as documentation and presentation of the progress. More information is available on request or can be found at https://www.biozentrum.uni-wuerzburg.de/pbio/		
Intended learning outcomes		
Students will be trained in using specific molecular biology methods or metabolite analysis approaches to address scientific questions, in the documentation of experimental procedures and results, and in the interpretation of data. They are competent to apply the rules of good scientific practice in experiments, interpretation of data and documentation. The experience with genetic engineering methods should enable the students to discuss the use of these methods with respect to sustainability and acceptance in society.		
Courses (type, number of weekly contact hours, language — if other than German)		
P (14) + S (1) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) The examination is basically conducted in the form of examination variant b) protocol (standard case); alternative forms of examination remain reserved. Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
Teaching cycle: winter semester and summer semester		

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

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Module title		Abbreviation
Plant Chemical Biology and Metabolism F2		07-MS3PCBF2-261-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	--
Contents		
Students will be involved in current research projects in plant chemical 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 student. Molecular biology methods and/or metabolite analytical approaches will be optimized for and adapted to the specific problem. Experimental results and progress in the understanding of biological problems will be documented in protocol form and presented in a seminar. More information is available on request or can be found at https://www.biozentrum.uni-wuerzburg.de/pbio/		
Intended learning outcomes		
Students are qualified to independently perform scientific experiments and to use specific molecular biology and bioanalytical methods to address current scientific questions in the field of metabolic regulation and metabolomics. Students are competent to critically assess and discuss their own and published data. Students are trained to apply the rules of good scientific practice in experiments, interpretation of data and documentation. The use of genetic engineering methods should enable students to form an independent, well-founded opinion on the significance of these methods in research, agriculture and industry, particularly with regard to sustainability.		
Courses (type, number of weekly contact hours, language — if other than German)		
P (29) + S (1) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
450 h		
Teaching cycle		
Teaching cycle: winter semester and summer semester		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Physiological Plant Ecology F1		07-MS3PPEF1-261-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		
Under the guidance of an experienced scientist, students will work on a current research topic from the field of ecology/ecophysiology. Particular emphasis will be placed on the physiological bases of the interactions between plants and abiotic and biotic environmental factors (e. g. water relations, stress, biogeography). Working concepts and complex experiments will be designed, and the results will be documented and presented in the form of a presentation, a publication or a log. The participants will be involved in ongoing projects and will deepen their knowledge on applying special methods, in ecophysiology in particular but also in chemical analysis.		
Intended learning outcomes		
The participants are able to perform scientific experiments in the field of physiological plant ecology and to apply appropriate methods. They are also able to address and document questions in the field of ecology/ecophysiology, adhering to the rules of good scientific practice.		
Courses (type, number of weekly contact hours, language — if other than German)		
P (14) + S (1) Module taught in: German and/or English		
Method of assessment (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, open questions as well as multiple choice) or b) log (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) The examination is basically conducted in the form of examination variant b) protocol (standard case); alternative forms of examination remain reserved. Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Physiological Plant Ecology F2		07-MS3PPEF2-261-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	--
Contents		
Students will work on projects taken from ongoing research in the supervisors' labs in the field of plant ecology and ecophysiology (e. g. plant-insect-, plant-fungus interactions; biogeography; water relations). They will do this work to a large extent on their own responsibility by performing advanced experiments, their documentation and evaluation. Based on the results obtained, the ecophysiological and analytical methods applied (e. g. measurement of transpiration, fluorescence microscopy, chlorophyll-fluorometry) will be critically assessed, and, where necessary, modified. The progress of the experiments and their contribution to more general projects will be documented and presented in the form of presentations, publications or logs.		
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)		
P (29) + S (1) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
450 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Systems Biology		07-MS3S-261-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	Cannot be combined with 07-MS-B.
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 (2) + S (1) Module taught in: German and/or English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Plant Signalling F1		07-MS3SPF1-261-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		
Molecular mechanisms of plant signal transduction and regulation of gene expression will be investigated in the context of plant-pathogen interaction, plant responses to abiotic stress, lipid signalling and plant hormone signalling. Specific molecular biology methods which are suitable to address these topics will be applied. In addition, students will gain experience in designing appropriate experimental approaches as well as in the documentation and presentation of results. Students will work on a current research project and learn to independently plan and perform the experiments. More information is available on request or can be found at http://www.p-bio.biozentrum.uni-wuerzburg.de/ .		
Intended learning outcomes		
Students will be trained to apply specific methods in the field of molecular biology, to address scientific questions, to document experimental procedures and results and to interpret experimental data.		
Courses (type, number of weekly contact hours, language — if other than German)		
P (14) + S (1) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) The examination is basically conducted in the form of examination variant b) protocol (standard case); alternative forms of examination remain reserved. Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Plant Signalling F2		07-MS3SPF2-261-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	--
Contents		
Students will independently work on aspects of current research projects in the area of plant signal transduction and stress responses. Results will be discussed in the context of recent publications. The molecular biology and bioanalytical methods which are used will be evaluated and optimised. The aim and progress of the project will be 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		
Students are able to independently perform scientific experiments and to use specific techniques in the field of molecular biology and bioanalytics to address scientific questions in the field of plant signal transduction. Students are able to independently work according to the rules of best practice.		
Courses (type, number of weekly contact hours, language — if other than German)		
P (29) + S (1) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
450 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Systems Biology F1		07-MS3SYF1-261-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 (14) + S (1) Module taught in: German and/or English		
Method of assessment (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, open questions as well as multiple choice) or b) log (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) The examination is basically conducted in the form of examination variant b) protocol (standard case); alternative forms of examination remain reserved. Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Systems Biology F2		07-MS3SYF2-261-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	--
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 (29) + S (1) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
450 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Topics in Systems Biology		07-MS3TSY-152-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)		
V (2) + S (1) Module taught in: English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Students will be informed about the method, length and scope of the assessment prior to the course. Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Methods in Molecular Biology F1		07-MS4MMBF1-261-m01
Module coordinator		Module offered by
chairs at the Julius-von-Sachs Institute, Chair of Biotechnology		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	Cannot be combined with 07-MS4PMBF1 only possible when choosing a minor subject topic
Contents		
The course teaches basic techniques of molecular biology and analytics, including the isolation and analysis of nucleic acids and natural substances. Scientific questions are addressed and the results discussed. The program is primarily intended for students interested in the field of molecular plant biology, but is also suitable for those from other disciplines focusing on molecular biology.		
Intended learning outcomes		
Students are qualified to perform scientific experiments using molecular biology and bioanalytical methods to address current scientific questions. Students are trained to work according to the rules of best practice.		
Courses (type, number of weekly contact hours, language — if other than German)		
P (14) + S (1) Module taught in: English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
Teaching cycle: every second semester		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Principles in Molecular Biology F1		07-MS4PMBF1-261-m01
Module coordinator		Module offered by
--		Faculty of Biology
ECTS	Method of grading	Only after succ. compl. of module(s)
10	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	--	Cannot be combined with 07-MS4MMBF1 only possible when choosing a minor subject topic
Contents		
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Intended learning outcomes		
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Courses (type, number of weekly contact hours, language — if other than German)		
P (14) + S (1) Module taught in: English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
External Internship 1		07-MSA1-261-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 (5) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
External Internship 2		07-MSA2-261-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 (15) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
External Internship 3		07-MSA3-261-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 (30) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
450 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Systems Biology B		07-MS-B-261-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	Cannot be combined with 07-MS3S.
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 (2) Module taught in: German and/or English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Biochemistry, Physiology and Genetics of Mammalian Cell Culture		07-MSCC-261-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 (3) Module taught in: English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Seminar Experimental Animal Ecology		07-MSET-261-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-MHWP), 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 (1) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
60 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Molecular Biology F1		07-MSF1-261-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	--
Contents		
Practical course on a topic in molecular biology. 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 defined experimental procedures and methods, to independently address scientific questions and to document their experimental work in an appropriate manner.		
Intended learning outcomes		
Students have reinforced previously acquired lab skills, acquired new molecular lab techniques and learned how to transfer theoretical knowledge into experiments. Students have gained expertise in the analysis of raw data, their interpretation and their presentation.		
Courses (type, number of weekly contact hours, language — if other than German)		
P (14) + S (1) Module taught in: German and/or English		
Method of assessment (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, open questions as well as multiple choice) or b) log (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) The examination is basically conducted in the form of examination variant b) protocol (standard case); alternative forms of examination remain reserved. Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Molecular Biology F2		07-MSF2-261-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	--
Contents		
Current problems in the field of molecular biology are 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 molecular biology. This practical course will have a duration of 12 weeks (three months) and will prepare participants for their theses.		
Intended learning outcomes		
Students are able to independently work in a laboratory. They are able to answer and discuss questions in the field of molecular biology. Students are able to adhere to the principles of good scientific practice as well as to document, interpret and discuss their results. They are able to apply specific molecular techniques that are required to answer scientific questions.		
Courses (type, number of weekly contact hours, language — if other than German)		
P (29) + S (1) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
450 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Laboratory Course 1		07-MSL1-261-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 (5) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Laboratory Course 2		07-MSL2-261-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 (15) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Laboratory Course 3		07-MSL3-261-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 (30) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
450 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Laboratory Research Training F1		07-MSLRTF1-261-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	Please consult with course advisory service in advance.
Contents		
Practical course on a biological topic. 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 defined experimental procedures and methods, to independently address scientific questions and to document their experimental work in an appropriate way.		
Intended learning outcomes		
Students have reinforced previously acquired lab skills, acquired new lab techniques and learned how to transfer theoretical knowledge into experiments. Students have gained expertise in the analysis of raw data, their interpretation and their presentation.		
Courses (type, number of weekly contact hours, language — if other than German)		
P (14) + S (1) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) The examination is basically conducted in the form of examination variant b) protocol (standard case); alternative forms of examination remain reserved. Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Soil Ecology		07-MSOI-261-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		
This course is a one-week block course. First, students get an introduction to soil biodiversity and soil ecology under global change and related to the sustainable use of anthropogenically-managed ecosystems. Afterwards, they learn how to assess and sample soil fauna communities (mesofauna, macrofauna, earthworms) in local habitats. Animals are sampled with adequate sampling techniques, extracted, and afterwards identified to the highest resolution possible. Finally, different habitats are compared based on their soil-fauna communities and the results will be contextualized among the existing literature.		
Intended learning outcomes		
This course enables students to assess and understand soil biodiversity and ecology under global change. Students will be able to recognize the major players of local soil fauna and scientifically describe their communities.		
Courses (type, number of weekly contact hours, language — if other than German)		
Ü (3) Module taught in: English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: English		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
Teaching cycle: Once a year, summer semester		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Molecular Parasitology		07-MSPAR-261-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	Cannot be combined with 07-MSPARB.
Contents		
The lecture <i>Molecular Parasitology</i> discusses molecular and genetic aspects of parasitic diseases in humans and animals. Special emphasis is on neglected tropical diseases.		
Intended learning outcomes		
Participants possess a knowledge of the theoretical principles underlying parasitology and are able to put this into the broader context of molecular cell biology research.		
Courses (type, number of weekly contact hours, language — if other than German)		
V (1) + S (2) Module taught in: German and/or English		
Method of assessment (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. 60 to 120 minutes) If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate). Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Molecular Parasitology B		07-MSPARB-261-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	Cannot be combined with 07-MSPAR.
Contents		
The lecture <i>Molecular Parasitology</i> discusses molecular and genetic aspects of parasitic diseases in humans and animals. Special emphasis is on neglected tropical diseases.		
Intended learning outcomes		
Participants possess a knowledge of the theoretical principles underlying parasitology and are able to put this into the broader context of molecular cell biology research.		
Courses (type, number of weekly contact hours, language — if other than German)		
V (1) Module taught in: German and/or English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
90 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Molecular Parasitology F1		07-MSPARF1-261-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		
This 5-week full-time practical course provides an introduction to modern methods and concepts in molecular parasitology. It introduces participants to a variety of parasites and encourages them to design and perform experiments of their own. Participants use the skills they have developed to analyse important biomedical processes.		
Intended learning outcomes		
The participants are able to perform scientific experiments in the field of molecular parasitology and to apply appropriate methods. They are able to address and document fundamental scientific questions, adhering to the rules of good scientific practice.		
Courses (type, number of weekly contact hours, language — if other than German)		
P (14) + S (1) Module taught in: German and/or English		
Method of assessment (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, open questions as well as multiple choice) or b) log (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) The examination is basically conducted in the form of examination variant b) protocol (standard case); alternative forms of examination remain reserved. Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
300 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Molecular Parasitology F2		07-MSPARF2-261-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	--
Contents		
Well-defined aspects of scientific projects are addressed with independently designed experiments in the context of current research projects in the field of molecular parasitology. 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 concluding progress report.		
Intended learning outcomes		
The participants are able to independently carry out scientific experiments in the field of molecular parasitology 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)		
P (29) + S (1) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
450 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Statistics and R in Ecology and Conservation		07-MSREC-261-m01
Module coordinator		Module offered by
holder of the Chair of Global Change Ecology		Faculty of Biology
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	graduate	--
Contents		
This block course teaches students the basics of statistics as well as the programming, graphics and statistics software R, with a special focus on methods and applications in and for ecology and conservation biology. In practical exercises, students learn the basics of the programming language R (base R and tidyverse) for data processing, analyses and graphics as well as standard methods of descriptive and analytical statistics (e.g. classical tests, linear regression, ANOVA, generalized linear models, mixed models, multivariate statistics, etc.).		
Intended learning outcomes		
At the end of the course, students will have a solid understanding of the most important methods of ecological and conservation biology statistics and will be able to use the R software for data processing, analyses and graphics. They will be able to identify the appropriate statistical methods to answer scientific questions and apply them accordingly. They are able to interpret and critically evaluate the results, present them graphically and discuss them in a differentiated manner.		
Courses (type, number of weekly contact hours, language — if other than German)		
Ü (5) Module taught in: English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: English		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
Teaching cycle: once a year, winter semester		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Seminar Tropical Biology		07-MSTROPS-261-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 seminar addresses fundamentals of the biology of tropical habitats and tropical communities. A special focus is on the global significance of tropical systems (biodiversity, ecosystem goods and ecosystem services). The course also highlights the biological features of these highly diverse biomes and compares them to the temperate zones.		
Intended learning outcomes		
Students will be able to recognise the special position of tropical habitats within the biosphere and to explain the significance tropical habitats have for our ecosystem. They will be able to evaluate the consequences of human interventions into tropical systems as well as associated conservation-related issues. Students will also be able to investigate, present, and discuss up-to-date publications in different thematic areas of tropical biology.		
Courses (type, number of weekly contact hours, language — if other than German)		
S (2) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Workshop on scientific approaches		07-MSWSA-261-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)
5	(not) successfully completed	--
Duration	Module level	Other prerequisites
1 semester	graduate	--
Contents		
Planning of scientific projects: Choosing the right questions, selection of appropriate methods, time management and experimental setups, literature and resources, how to keep records, handling of equipment, assessment and evaluation of results incl. statistics, presentation of data, scientific writing. Besides the theoretical handling of these aspects, we will pick a current topic in field of Neurogenetics for a practical application.		
Intended learning outcomes		
The participants understand how to plan and to perform a scientific project. They are able to choose appropriate methods, to plan the experimental setup, to perform appropriate experiments, to evaluate and to analyze the results and to present and to summarize their data.		
Courses (type, number of weekly contact hours, language — if other than German)		
Ü (3) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Oral Examination Biosciences		07-MT-K-162-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)
5	numerical grade	07-MT-1
Duration	Module level	Other prerequisites
1 semester	undergraduate	--
Contents		
Verification of thesis content through oral examination. Total length should not exceed 45 minutes (30 minutes plus 15 minutes of questions pertaining to the thesis as well as related subjects).		
Intended learning outcomes		
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)		
K (o) Module taught in: German and/or English		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)		
final colloquium (approx. 45 minutes) comprising: talk on thesis (30 minutes) and subsequent defence of thesis (15 minutes); defence usually public Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Animal Ecology and Tropical Biology 2 B		07-MTÖ2B-261-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	Cannot be combined with 07-MS1TÖ2.
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 (2) Module taught in: English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Animal Ecology and Tropical Biology B		07-MTÖB-261-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	Cannot be combined with 07-MS1TÖ.
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 (2) Module taught in: German and/or English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Tropical Ecology		07-MTROP-261-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 (3) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Master Thesis Biosciences		07-MT-T-162-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)
25	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	--
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)		
No courses assigned to module Module taught in: German and/or English		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)		
written thesis Language of assessment: German and/or English		
Allocation of places		
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Additional information		
Time to complete: 6 months.		
Workload		
750 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Entrepreneurial Thinking in the Biosciences		07-MUDB-261-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)		
S (1) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Special Subject Studies outside Natural Sciences 1		07-MV1-152-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 in advance.
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)		
S (1) Module taught in: German and/or English Course type: might also be offered in V, Ü, P, R or E format		
Method of assessment (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 Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
60 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Special Subject Studies outside Natural Sciences 2		07-MV2-261-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 in advance. Cannot be combined with 07-MV2B.
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)		
S (1) Module taught in: German and/or English Course type: might also be offered in V, Ü, P, R or E format		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
90 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Special Subject Studies outside Natural Sciences 2B		07-MV2B-261-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	Please consult with course advisory service in advance. Cannot be combined with 07-MV2.
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)		
S (1) Module taught in: German and/or English Course type: might also be offered in V, Ü, P, R or E format		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
90 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Special Subject Studies outside Natural Sciences 3		07-MV3-152-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 in advance.
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)		
S (2) Module taught in: German and/or English		
Method of assessment (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 Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
120 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Special Subject Studies outside Natural Sciences 4		07-MV4-261-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 in advance. Cannot be combined with 07-MV4B.
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)		
S (2) Module taught in: German and/or English Course type: might also be offered in V, Ü, P, R or E format		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Special Subject Studies outside Natural Sciences 4B		07-MV4B-261-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. Cannot be combined with 07-MV4.
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)		
S (2) Module taught in: German and/or English Course type: might also be offered in V, Ü, P, R or E format		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Special Subject Studies Biology and Natural Sciences 1		07-MVMINT1-152-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 in advance.
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)		
S (1) Module taught in: German and/or English Course type: might also be offered in V, Ü, P, R or E format		
Method of assessment (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 Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
60 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Special Subject Studies Biology and Natural Sciences 2		07-MVMINT2-261-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 in advance. Cannot be combined with 07-MVMINT2B.
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)		
S (1) Module taught in: German and/or English Course type: might also be offered in V, Ü, P, R or E format		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
90 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Special Subject Studies Biology and Natural Sciences 2B		07-MVMINT2B-261-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	Please consult with course advisory service in advance. Cannot be combined with 07-MVMINT2.
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)		
S (1) Module taught in: German and/or English Course type: might also be offered in V, Ü, P, R or E format		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
90 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Special Subject Studies Biology and Natural Sciences 3		07-MVMINT3-152-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 in advance.
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)		
S (2) Module taught in: German and/or English Course type: might also be offered in V, Ü, P, R or E format		
Method of assessment (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 Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
120 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Special Subject Studies Biology and Natural Sciences 4		07-MVMINT4-261-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 in advance. Cannot be combined with 07-MVMINT4B.
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)		
S (2) Module taught in: German and/or English Course type: might also be offered in V, Ü, P, R or E format		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Special Subject Studies Biology and Natural Sciences 4B		07-MVMINT4B-261-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. Cannot be combined with 07-MVMINT4.
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)		
S (2) Module taught in: German and/or English Course type: might also be offered in V, Ü, P, R or E format		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Special Subject Studies Biology and Natural Sciences 5		07-MVMINT5-152-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 in advance.
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)		
S (3) Module taught in: German and/or English Course type: might also be offered in V, Ü, P, R or E format		
Method of assessment (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 Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
180 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Theory and History of Science		07-MWIG-261-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 (2) Module taught in: German and/or English		
Method of assessment (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 (15 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 (30 to 60 minutes) or e) presentation (20 to 40 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
90 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Cell and Developmental Biology Master 1 B		07-MZE1-B-261-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	Cannot be combined with 07-MS2ZE1.
Contents		
The lecture <i>Zellpathologie</i> (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 (1) Module taught in: German and/or English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
90 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Cell and Developmental Biology Master 2 B		07-MZE2-B-261-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	Cannot be combined with 07-MS2ZE2.
Contents		
The lecture <i>Signale und Differenzierung (Signals and Differentiation)</i> does not attempt to impart pure textbook knowledge. Instead, historically important as well as particularly interesting and important trend-setting topics in developmental biology are presented. The topics range from classical developmental subjects such as tissue regeneration and morphogenetic cell migration to molecular stem cell biology, epigenetic plasticity, origins of multicellularity and development within changing environments.		
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 (1) Module taught in: English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
90 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Clinical Tumor Biology		07-TUM-CLIN-152-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	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	graduate	--
Contents		
In the lecture series <i>Klinische Tumorbologie (Clinical Tumour Biology)</i> , current clinical aspects will be addressed. Several tumour types will be discussed (such as tumours of the skin, lung, intestine, breast, blood). Additional topics: diagnostics and pathology, different treatments and therapies and clinical trials.		
Intended learning outcomes		
Knowledge of the similarities and differences of various tumour types. Understanding of requirements, possibilities and limitations of clinical medicine.		
Courses (type, number of weekly contact hours, language — if other than German)		
V (2) Module taught in: German and/or English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Students will be informed about the method, length and scope of the assessment prior to the course. Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module title		Abbreviation
Molecular Tumor Biology		07-TUM-MOL-152-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	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	graduate	--
Contents		
The lecture <i>Molekulare Tumorbologie (Molecular Tumour Biology)</i> discusses molecular characteristics of tumours and relevant biological processes (such as signal transduction, cell growth, cell proliferation, metabolism), tumour-specific modifications and current molecular biological methods in tumour research.		
Intended learning outcomes		
Understanding of current topics and challenges in tumour research, understanding of the methods which could be used address these challenges.		
Courses (type, number of weekly contact hours, language — if other than German)		
V (2) Module taught in: German and/or English		
Method of assessment (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 c) oral examination of one candidate each (30 to 60 minutes) or d) oral examination in groups of up to 3 candidates (30 to 60 minutes) Students will be informed about the method, length and scope of the assessment prior to the course. Language of assessment: German and/or English		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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