

Modules for Biology

Date 21/11/19

Basismodule

bio210 - General Biology

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|---|--|--|------------------|----------------------------|
| Module label | General Biology | | | |
| Module code | bio210 | | | |
| Credit points | 12.0 KP | | | |
| Workload | 360 h | | | |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Basismodule • Bachelor's Programme Mathematics (Bachelor) > Nebenfachmodule • Dual-Subject Bachelor's Programme Biology (Bachelor) > Basismodule | | | |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Gabriele Gerlach <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Gabriele Gerlach ◦ Gerhard Wolfgang Zotz <p>Module counseling</p> <ul style="list-style-type: none"> ◦ Gerhard Wolfgang Zotz | | | |
| Entry requirements | | | | |
| Skills to be acquired in this module | <p>++ biological knowledge + knowledge of biological working methods ++ biologically relevant knowledge in the natural sciences and mathematics + interdisciplinary knowledge & thinking</p> <p>The students are enabled:</p> <ul style="list-style-type: none"> • to understand and explain the fundamentals of the subjects dealt with in "Purves" or "Campbell" and to give examples, • to find the rôle of biology in other special fields according to their inclinations and abilities, • to reflect upon the rôle of biology in other special fields and in a modern society, • to approach their individual planning of studies according to their inclinations and abilities | | | |
| Module contents | The lecture imparts the basic knowledge of biology and covers the subjects dealt with in the textbooks "Purves" or "Campbell" | | | |
| Reader's advisory | Purves, Spektrum Verlag, latest edition Campbell, Pearson Verlag, latest edition | | | |
| Links | | | | |
| Language of instruction | German | | | |
| Duration (semesters) | 2 Semester | | | |
| Module frequency | jährlich | | | |
| Module capacity | unlimited | | | |
| Modullevel | --- | | | |
| Modulart | Pflicht / Mandatory | | | |
| Lern-/Lehrform / Type of program | (pro Semester) | | | |
| Vorkenntnisse / Previous knowledge | | | | |
| Examination | Time of examination | Type of examination | | |
| Final exam of module | Written examination either in the final week of the semester or in the first week of the semester vacation | One written examination in the winter and summer terms (50 % each) | | |
| | | PLEASE NOTE: Additional conditions regarding attendance and ungraded activities as determined by the persons responsible for the module will apply. | | |
| Course type | Comment | SWS | Frequency | Workload attendance |
| Lecture | | 8.00 | | 112 h |

| Course type | Comment | SWS | Frequency | Workload attendance |
|--|---|------|---------------|---------------------|
| Tutorial | | 0.00 | WiSe | 0 h |
| Seminar (PFLICHT für Erstsemester!) | Pflichtveranstaltung für alle Studierenden im 1. Semester (Bachelor und Master) | 0.00 | SuSe and WiSe | 0 h |
| Total time of attendance for the module | | | | 112 h |

bio215 - Introduction to Biology

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|--|--|------|--|---------------------|
| Module label | Introduction to Biology | | | |
| Module code | bio215 | | | |
| Credit points | 9.0 KP | | | |
| Workload | 270 h | | | |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Basismodule • Bachelor's Programme Mathematics (Bachelor) > Nebenfachmodule • Dual-Subject Bachelor's Programme Biology (Bachelor) > Basismodule | | | |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Gabriele Gerlach ◦ Christine Köppl <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Gabriele Gerlach ◦ Christine Köppl ◦ Gerhard Wolfgang Zotz ◦ Ulrike Sienknecht <p>Module counseling</p> <ul style="list-style-type: none"> ◦ Gerhard Wolfgang Zotz ◦ Ulrike Sienknecht | | | |
| Entry requirements | | | | |
| Skills to be acquired in this module | ++ biological knowledge + knowledge of techniques in biology ++ biologically relevant knowledge in the natural sciences and mathematics + cross-disciplinary knowledge and thinking | | | |
| Module contents | Lecture conveys knowledge in <ul style="list-style-type: none"> • evolution, ecology and biodiversity (WiSe) • animal physiology and developmental biology (SoSe) | | | |
| Reader's advisory | Campbell et al. "Biologie", Pearson Sadava et al. "Purves, Biologie", Springer | | | |
| Links | | | | |
| Language of instruction | German | | | |
| Duration (semesters) | 2 Semester | | | |
| Module frequency | | | | |
| Module capacity | 300 | | | |
| Modullevel | BC (Basiscurriculum / Base curriculum) | | | |
| Modulart | Pflicht / Mandatory | | | |
| Lern-/Lehrform / Type of program | Vorlesung | | | |
| Vorkenntnisse / Previous knowledge | | | | |
| Examination | Time of examination | | Type of examination | |
| Final exam of module | lecture-free periods after each series | | 2 written examinations (WiSe and SoSe) | |
| Course type | Comment | SWS | Frequency | Workload attendance |
| Lecture | | 6.00 | SuSe and WiSe | 84 h |
| Seminar (PFLICHT für Erstsemester!) | | 0.00 | WiSe | 0 h |
| Tutorial (optinal) | | 0.00 | -- | 0 h |
| Total time of attendance for the module | | | | 84 h |

bio220 - Introductory Zoology-Botany

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|---|---|
| Module label | Introductory Zoology-Botany |
| Module code | bio220 |
| Credit points | 9.0 KP |
| Workload | 270 h |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Basismodule • Dual-Subject Bachelor's Programme Biology (Bachelor) > Basismodule |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Gerhard Wolfgang Zotz ◦ Olaf Bininda-Emonds <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Wilko Ahlrichs ◦ Olaf Bininda-Emonds ◦ Thomas Glatzel ◦ Gerhard Wolfgang Zotz <p>Module counseling</p> <ul style="list-style-type: none"> ◦ Wilko Ahlrichs ◦ Thomas Glatzel |
| Entry requirements | keine |
| Skills to be acquired in this module | <p>++ biological knowledge + knowledge of biological working methods ++ biologically relevant knowledge in the natural sciences and mathematics + abstract, logical, analytical thinking + independent learning and (research-based) working + teamwork</p> <p>THEORY:</p> <ul style="list-style-type: none"> * To understand the fundamentals of reconstructing phylogenetic relationships * To know the phylogenetic system and ground pattern of high-ranking ancestral animal species * To know the cell structures, organization, and reproduction of plants and animals * To know the morphology and anatomy of individual species <p>PRACTICE:</p> <ul style="list-style-type: none"> * To improve and verify the theoretical knowledge acquired from lectures and textbooks by studying the original * To train visual and tactile perception by studying various species * To learn that representations in textbooks are abstractions of a much more complex reality * To be able to criticize representations in textbooks and models * To acquire the knowledge of the function in living animals and plants by studying preserved specimens * Learning how to follow preparation instructions * Learning that the organization of individual species may be highly variable * Preparing records or drawings from the information obtained by original specimens studied |
| Module contents | <p>GENERAL: Light microscopic methods are applied to study structures in plants and animals. Records in the form of descriptions and drawings.</p> <p>BOTANY: Morphological structure and reproduction of various plant organization types with a focus on the structure of plant tissue. Representation of the relationships between structure and function with regard to absorption processes, transport processes, transpiration, and photosynthesis.</p> <p>ZOOLOGY: Morphological structure of animal tissues. Biology of selected partial taxa and metazoans. Principles of phylogenetic systematics and the phylogenetic position in the animal system of the taxa dealt with.</p> |
| Reader's advisory | <p>GENERAL:: Campbell: Biologie (Spektrum Verlag) or Purves: Biologie (Spektrum Verlag), latest edition</p> <p>ZOOLOGY: V. Storch: Kükenthal Zoologisches Praktikum, one of the latest editions; Optional: Ax, P. (1999-2001): Das System der Metazoa (I,II, III), Fischer Verlag. Westheide/Rieger (1996): Spezielle Zoologie " First part: Einzeller und Wirbellose Tiere, Gustav Fischer Verlag, Stuttgart; Westheide, Wilfried; Rieger, Reinhard Spezielle Zoologie. Second part: Wirbel- oder Schädeltiere 2003, 714 S., 650 s/w Abb. Gebunden ISBN 3-8274-0900-4.</p> |

BOTANY: Script; Kück, Wolff Botanisches Grundpraktikum, 2nd edition, Springer, 2008, UTB; Grundlagen der Botanik, UTB; Lüttge, Kluge, Bauer, Botanik, WILEY-VCH, 2010

Links

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|--------------------------------|--|
| Language of instruction | German |
| Duration (semesters) | 1 Semester |
| Module frequency | jährlich |
| Module capacity | unlimited |
| Modullevel | BC (Basiscurriculum / Base curriculum) |
| Modulart | Pflicht / Mandatory |

Lern-/Lehrform / Type of program

Vorkenntnisse / Previous knowledge

| Examination | Time of examination | Type of examination |
|-----------------------------|---|---|
| Final exam of module | Written examination in the final week of the current part | 1 written examination (50%) following the part Zoology 1 written examination (50%) following the part Botany; voluntary bonus (10%) in the second part (botany) PLEASE NOTE: Additional conditions regarding attendance and ungraded activities as determined by the persons responsible for the module will apply. |

| Course type | Comment | SWS | Frequency | Workload attendance |
|--|---------|------|-----------|---------------------|
| Lecture | | 2.00 | | 28 h |
| Exercises | | 4.00 | | 56 h |
| Tutorial | | 0.00 | WiSe | 0 h |
| Total time of attendance for the module | | | | 84 h |

bio233 - Basics in Microbiology and Genetics

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|--|---|--|------------------|----------------------------|
| Module label | Basics in Microbiology and Genetics | | | |
| Module code | bio233 | | | |
| Credit points | 6.0 KP | | | |
| Workload | 180 h | | | |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Basismodule • Dual-Subject Bachelor's Programme Biology (Bachelor) > Basismodule | | | |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Ralf Andreas Rabus <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Ralf Andreas Rabus ◦ Maike Claußen <p>Module counseling</p> <ul style="list-style-type: none"> ◦ Maike Claußen | | | |
| Entry requirements | | | | |
| Skills to be acquired in this module | <p>++ biological knowledge + knowledge of biological working methods + biologically relevant knowledge in the natural sciences and mathematics + deepened expertise in biological specialist field + independent learning and (research-based) working</p> | | | |
| Module contents | <p>Grundlagen der Mikrobiologie und Genetik: Mikrobiologie: Moleküle des Lebens; Energie und Enzyme,; Zentralstoffwechsel; Atmung; Photosynthese; anaerober Stoffwechsel; Chemolithotrophie; prokaryotische Zellstruktur; mikrobielle Diversität; Bedeutung von Mikroorganismen für Mensch, Pflanze und Tier, Biotechnologie und Erdsystem. Genetik: Mitose und Zellzyklus, Meiose und Rekombination, Mendelsche Vererbungslehre, chromosomale und molekulare Grundlagen der Vererbung; Replikation, Transkription, Translation, Mutation und DNA-Reparatur, Organisation des genetischen Materials und Genregulation</p> | | | |
| Reader's advisory | <p>Purves Biologie (Spektrum Verlag), neuste Ausgabe Campbell et al., Biologie (Pearson Verlag), neuste Ausgabe Fuchs, Allgemeine Mikrobiologie (Thieme Verlag), neueste Auflage</p> | | | |
| Links | | | | |
| Language of instruction | German | | | |
| Duration (semesters) | 1 Semester | | | |
| Module frequency | | | | |
| Module capacity | unlimited | | | |
| Modullevel | BC (Basiscurriculum / Base curriculum) | | | |
| Modulart | Pflicht / Mandatory | | | |
| Lern-/Lehrform / Type of program | lecture | | | |
| Vorkenntnisse / Previous knowledge | | | | |
| Examination | Time of examination | Type of examination | | |
| Final exam of module | Klausuren direkt nach jeweiligem Veranstaltungsteil | 2 Prüfungsleistungen: | | |
| | | <ul style="list-style-type: none"> • 1 Klausur (50 %) nach dem Teil Mikrobiologie • 1 Klausur (50 %) nach dem Teil Genetik | | |
| Course type | Comment | SWS | Frequency | Workload attendance |
| Lecture | | 4.00 | SuSe or WiSe | 56 h |
| Tutorial (optional) | | 0.00 | SuSe and WiSe | 0 h |
| Total time of attendance for the module | | | | 56 h |

bio236 - Basics in Biochemistry and Cell Biology

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|---|--|---------------------|
| Module label | Basics in Biochemistry and Cell Biology | |
| Module code | bio236 | |
| Credit points | 6.0 KP | |
| Workload | 180 h | |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Basismodule • Dual-Subject Bachelor's Programme Biology (Bachelor) > Basismodule | |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Karl-Wilhelm Koch <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Karl-Wilhelm Koch ◦ Michael Winklhofer <p>Module counseling</p> <ul style="list-style-type: none"> ◦ Michael Winklhofer | |
| Entry requirements | Zulassung BSc Biologie | |
| Skills to be acquired in this module | <p>++ biological knowledge + knowledge of biological working methods ++ biologically relevant knowledge in the natural sciences and mathematics + abstract, logical, analytical thinking</p> | |
| Module contents | Introduction to structure and function of main biochemical building blocks; amino acids, carbohydrates, proteins, nucleic acids, introduction to metabolism; biological membranes and transmembrane transport; structure and function of cell organelles; protein synthesis and postranslational modification, intracellular transport and trafficking, signalling agents and cellular communication, cell division, controlled cell death | |
| Reader's advisory | <p>Biochemie, Müller-Esterl Stryer Biochemie, Berg, Tymoczko, Stryer Lehninger Prinzipien der Biochemie, David L. Nelson und Michael M. Cox Principles of Biochemistry, Horton et al. Zellbiologie, Helmut Plattner und Joachim Hentschel Molekulare Zellbiologie, Gerald Karp Molekularbiologie der Zelle, Bruce Alberts</p> | |
| Links | | |
| Language of instruction | German | |
| Duration (semesters) | 1 Semester | |
| Module frequency | | |
| Module capacity | unlimited | |
| Modullevel | BC (Basiscurriculum / Base curriculum) | |
| Modulart | Pflicht / Mandatory | |
| Lern-/Lehrform / Type of program | lecture | |
| Vorkenntnisse / Previous knowledge | | |
| Examination | Time of examination | Type of examination |
| Final exam of module | during the semester | written exam |
| Course type | Lecture | |
| SWS | 4.00 | |
| Frequency | WiSe | |
| Workload attendance | 56 h | |

bio230 - Microbiology and Cell Biology

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|---|---|---|------------------|----------------------------|
| Module label | Microbiology and Cell Biology | | | |
| Module code | bio230 | | | |
| Credit points | 9.0 KP | | | |
| Workload | 270 h | | | |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Basismodule • Dual-Subject Bachelor's Programme Biology (Bachelor) > Basismodule | | | |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Ralf Andreas Rabus <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Ralf Andreas Rabus ◦ Hans Gerd Nothwang ◦ Maïke Claußen <p>Module counseling</p> <ul style="list-style-type: none"> ◦ Maïke Claußen | | | |
| Entry requirements | | | | |
| Skills to be acquired in this module | <p>++ biological knowledge ++ knowledge of biological working methods + biologically relevant knowledge in the natural sciences and mathematics + abstract, logical, analytical thinking + deepened expertise in biological specialist field + teamwork</p> <p>Theory: Basic knowledge in Biochemistry, Microbiology, Cell Biology and Genetics Practice: Basic methodological skills acquired by performing experiments</p> | | | |
| Module contents | <p>Fundamentals of Microbiology and Cell Biology: Molecules of life; energy and enzymes; central metabolism; breathing; photosynthesis; anaerobic metabolism; chemolithotrophy; procaryotic and eucaryotic cell structures; microbial diversity; importance of microorganisms for human beings, plants, animals, biotechnology and earth system cell group; signal transmission and communication between cells; meiosis; mitosis; mendelian inheritance; chromosomal and molecular basis of inheritance; replication; transcription; translation; genomic organization; mutation and repair.</p> | | | |
| Reader's advisory | <p>Purves et al., Biologie (Spektrum Verlag), latest edition Campbell, Pearson Verlag, latest edition Fuchs, Allgemeine Mikrobiologie (Thieme Verlag), latest edition Lodisch et al., Molekulare Zellbiologie (Spektrum Verlag), latest edition</p> | | | |
| Links | | | | |
| Language of instruction | German | | | |
| Duration (semesters) | 1 Semester | | | |
| Module frequency | jährlich | | | |
| Module capacity | unlimited | | | |
| Modullevel | BC (Basiscurriculum / Base curriculum) | | | |
| Modulart | Pflicht / Mandatory | | | |
| Lern-/Lehrform / Type of program | | | | |
| Vorkenntnisse / Previous knowledge | | | | |
| Examination | Time of examination | Type of examination | | |
| Final exam of module | Written examination in the final week of the current part | <p>1 written examination (50%) following the part Microbiology 1 written examination (50%) following the part Cell Biology</p> <p>Records are collected following every course day.</p> <p>PLEASE NOTE: Additional conditions regarding attendance and ungraded activities as determined by the persons responsible for the module will apply</p> | | |
| Course type | Comment | SWS | Frequency | Workload attendance |

| Course type | Comment | SWS | Frequency | Workload attendance |
|--|---------|------|-----------|---------------------|
| Lecture | | 4.00 | | 56 h |
| Exercises | | 2.00 | | 28 h |
| Total time of attendance for the module | | | | 84 h |

Aufbaumodule

bio255 - Basics in Biochemistry and Cell Biology

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|--|--|------|---------------------|---------------------|
| Module label | Basics in Biochemistry and Cell Biology | | | |
| Module code | bio255 | | | |
| Credit points | 9.0 KP | | | |
| Workload | 270 h | | | |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Aufbaumodule • Dual-Subject Bachelor's Programme Biology (Bachelor) > Aufbaumodule | | | |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Arne Nolte <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Arne Nolte | | | |
| Entry requirements | | | | |
| Skills to be acquired in this module | <p>++ biological knowledge ++ knowledge of biological working methods ++ biologically relevant knowledge in the natural sciences and mathematics + statistics & scientific programming ++ interdisciplinary knowledge & thinking ++ abstract, logical, analytical thinking ++ deepened expertise in biological specialist field</p> <p>The field of molecular ecology examines relationships among genotypes, phenotypes and the environment to explain evolution and diversity of organisms. The lecture will introduce basics in genomics, molecular evolution and population genetics to explore properties of the genome and the organism from an evolutionary perspective. Central aspects are the adaptation of species to their environment and ecological change, speciation, the genetic basis of phenotypic change. Methods and data used in genomics and molecular ecology will be introduced during the lecture and exercises.</p> | | | |
| Module contents | <p>Lecture: the lecture conveys knowledge about the fields of genomics, evolution and organismic biology. Moreover laboratory methods as well as basics and background information on the analysis of genetic and genomic datasets are given.</p> <p>Excercise: Modern data sets and up to date methods in genomics and population genetics are introduced. The practical emphasizes computer based data analyses.</p> | | | |
| Reader's advisory | | | | |
| Links | | | | |
| Language of instruction | German | | | |
| Duration (semesters) | 1 Semester | | | |
| Module frequency | | | | |
| Module capacity | 30 | | | |
| Modullevel | AC (Aufbaucurriculum / Composition) | | | |
| Modulart | Wahlpflicht / Elective | | | |
| Lern-/Lehrform / Type of program | Vorlesung, Übung | | | |
| Vorkenntnisse / Previous knowledge | | | | |
| Examination | Time of examination | | Type of examination | |
| Final exam of module | | | exam | |
| Course type | Comment | SWS | Frequency | Workload attendance |
| Lecture | | 1.50 | WiSe | 21 h |
| Exercises | | 4.50 | WiSe | 63 h |
| Total time of attendance for the module | | | | 84 h |

bio256 - Form and Identification - Flora and Fauna

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|---|---|--|
| Module label | Form and Identification - Flora and Fauna | |
| Module code | bio256 | |
| Credit points | 12.0 KP | |
| Workload | 360 h | |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Aufbaumodule | |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Dirk Carl Albach ◦ Thomas Glatzel <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Dirk Carl Albach ◦ Thomas Glatzel ◦ Maria Will ◦ Rolf Niedringhaus ◦ Klaus Bernhard von Hagen ◦ Frank Henrik Donat <p>Module counseling</p> <ul style="list-style-type: none"> ◦ Maria Will ◦ Rolf Niedringhaus ◦ Klaus Bernhard von Hagen ◦ Frank Henrik Donat | |
| Entry requirements | | |
| Skills to be acquired in this module | <p>+ biological knowledge + knowledge of biological working methods + independent learning and (research-based) working + knowledge of safety and environmental issues</p> <p>The module conveys the basic knowledge in animal and plant identification and their diversity. This is essential for all parts of biology concerned with plants and animals. Especially, education for the field of conservation and schools rely on these expertises. Therefore, topics and methods relevant for these professions are emphasized. Students shall get a basic knowledge of species and learn methods to identify them. This is connected with a systemic knowledge of habitats in Northwestern Germany. Basic evaluation competence in the field of biodiversity, species diversity and conservation is conveyed to sensitize students for a respectful treatment of organisms.</p> | |
| Module contents | <p>L: Introduction to the diversity of native flora and fauna, presentation of important plant and animal groups, introduction to systematics and major traits, ecological perspectives of species diversity EXE: Working with identification keys for plants and animals and their classification EXC: Excursion to characteristic habitats of Northwestern Germany, practicing work with field guides and identification of important traits</p> | |
| Reader's advisory | <p>Botany: Rothmaler - Exkursionsflora von Deutschland, Band 2 - Grundband, Spektrum Akademischer Verlag Zoology: M. Schaefer: Brohmer - Fauna von Deutschland, ab 20. Auflage B. Klausnitzer: Stresemann - Exkursionsfauna von Deutschland. Band 1: Wirbellose (ohne In-sekten)</p> | |
| Links | | |
| Language of instruction | German | |
| Duration (semesters) | 2 Semester | |
| Module frequency | | |
| Module capacity | unlimited | |
| Modullevel | AC (Aufbaucurriculum / Composition) | |
| Modulart | Pflicht / Mandatory | |
| Lern-/Lehrform / Type of program | Vorlesung, Übung, Exkursion | |
| Vorkenntnisse / Previous knowledge | | |
| Examination | Time of examination | Type of examination |
| Final exam of module | exams at the end of the semester | 1 written exam (botany) 50%, 1 written exam (zoology) 50%, excursion protocols (ungraded), additional requirements regarding presence and ungraded activities as specified by docents responsible for the module |

| Course type | Comment | SWS | Frequency | Workload attendance |
|--|---------|------|--------------|---------------------|
| Lecture | | 2.00 | SuSe or WiSe | 28 h |
| Exercises | | 5.00 | SuSe or WiSe | 70 h |
| Study trip | | 1.00 | SuSe or WiSe | 14 h |
| Total time of attendance for the module | | | | 112 h |

bio265 - General Microbiology

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|--|--|--|------------------|----------------------------|
| Module label | General Microbiology | | | |
| Module code | bio265 | | | |
| Credit points | 9.0 KP | | | |
| Workload | 270 h | | | |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Aufbaumodule • Bachelor's Programme Environmental Science (Bachelor) > Wahlpflichtmodule • Dual-Subject Bachelor's Programme Biology (Bachelor) > Aufbaumodule | | | |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Ralf Andreas Rabus <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Ralf Andreas Rabus ◦ Erhard Rhiel ◦ Lars Wöhlbrand <p>Module counseling</p> <ul style="list-style-type: none"> ◦ Erhard Rhiel ◦ Lars Wöhlbrand | | | |
| Entry requirements | | | | |
| Skills to be acquired in this module | Basic knowledge of microbiology; ability to assess and apply fundamental microbiological techniques. | | | |
| Module contents | Imparting basic microbiological skills and working methods: Chemistry and structure of the cell, fundamentals of metabolism, taxonomy and phylogeny of microorganisms, diversity of microorganisms, insight into Applied Microbiology, propagation of microorganisms. | | | |
| Reader's advisory | Allgemeine Mikrobiologie, Schlegel 1992; Brock-Biology of Microorganisms, eds.: Madigan et al., 2003; Grundlagen der Mikrobiologie, Cypionka, 2003 | | | |
| Links | http://www-icbm.de/~gmb/11429.html | | | |
| Language of instruction | German | | | |
| Duration (semesters) | 1 Semester | | | |
| Module frequency | jährlich | | | |
| Module capacity | unlimited | | | |
| Modullevel | --- | | | |
| Modulart | je nach Studiengang Pflicht oder Wahlpflicht | | | |
| Lern-/Lehrform / Type of program | | | | |
| Vorkenntnisse / Previous knowledge | | | | |
| Examination | Time of examination | Type of examination | | |
| Final exam of module | | 1 written examination | | |
| | | PLEASE NOTE: Additional conditions regarding attendance and ungraded activities as determined by the persons responsible for the module will apply. | | |
| Course type | Comment | SWS | Frequency | Workload attendance |
| Lecture | | 2.00 | WiSe | 28 h |
| Seminar | | 1.00 | WiSe | 14 h |
| Practical | | 4.00 | WiSe | 56 h |
| Total time of attendance for the module | | | | 98 h |

bio275 - Basics in Physiology

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|---|--|--|------------------|----------------------------|
| Module label | Basics in Physiology | | | |
| Module code | bio275 | | | |
| Credit points | 9.0 KP | | | |
| Workload | 270 h | | | |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Aufbaumodule • Bachelor's Programme Mathematics (Bachelor) > Nebenfachmodule • Dual-Subject Bachelor's Programme Biology (Bachelor) > Aufbaumodule | | | |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Dominik Heyers <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Dominik Heyers ◦ Christine Köppl ◦ Karin Dedek <p>Module counseling</p> <ul style="list-style-type: none"> ◦ Christine Köppl ◦ Karin Dedek | | | |
| Entry requirements | | | | |
| Skills to be acquired in this module | <p>++ biological knowledge ++ knowledge of biological working methods + biologically relevant knowledge in the natural sciences and mathematics + statistics & scientific programming ++ abstract, logical, analytical thinking + deepened expertise in biological specialist field ++ independent learning and (research-based) working + teamwork</p> <p>Basic knowledge on physiological processes and their underlying mechanisms with a focus on human physiology. Designing, performing, documenting and analysing physiological experiments; troubleshooting, basic statistics, "experimental thinking".</p> | | | |
| Module contents | The lecture covers topics such as cell physiology, sensory physiology, neurophysiology, functions of the vegetative system, blood physiology/immune response, blood cycle, respiration and digestion. Emphasis will be on human physiology. In the following lab exercises, students get the opportunity to perform physiological experiments linking to topics from the lecture. By performing experiments on themselves and computer simulations students will gain insight into the underlying physiological principles. | | | |
| Reader's advisory | Klinke, Pape, Kurtz, Silbernagl: Physiologie, Aufl. 4, 2014 Schmidt, Lang, Heckmann: Physiologie des Menschen mit Pathophysiologie, Aufl. 31, 2011 Wehner, Gehring: Zoologie, Aufl. 25, 2013 | | | |
| Links | | | | |
| Language of instruction | German | | | |
| Duration (semesters) | 1 Semester | | | |
| Module frequency | jährlich | | | |
| Module capacity | 144 | | | |
| Modullevel | AC (Aufbaucurriculum / Composition) | | | |
| Modulart | Wahlpflicht / Elective | | | |
| Lern-/Lehrform / Type of program | Vorlesung, Übung | | | |
| Vorkenntnisse / Previous knowledge | | | | |
| Examination | Time of examination | Type of examination | | |
| Final exam of module | within a few weeks after the winter term lecture period | written exam (100%) | | |
| | | Written protocols and active participation in the lab exercises. A cumulative bonus can be obtained with good lab protocols. The decision whether a given protocol deserves the bonus lies with the respective supervisor of each experiment. An exam mark of 1.0 is achievable without a bonus. A bonus cannot be applied to pass a failed exam. | | |
| Course type | Comment | SWS | Frequency | Workload attendance |

| Course type | Comment | SWS | Frequency | Workload attendance |
|--|--|------|-----------|---------------------|
| Lecture | | 4.00 | WiSe | 56 h |
| Exercises | A C H T U N G Die endgültige Einteilung für die Teilkurse wird über Stud.IP vorgenommen. Bitte achten Sie zu BEGINN des WiSe auf entsprechende Mitteilungen über Stud.IP. | 2.00 | WiSe | 28 h |
| Total time of attendance for the module | | | | 84 h |

bio285 - Plant Physiology, Molecular Biology and Biotechnology

| | | | | |
|--|--|------|---------------------|---------------------|
| Module label | Plant Physiology, Molecular Biology and Biotechnology | | | |
| Module code | bio285 | | | |
| Credit points | 9.0 KP | | | |
| Workload | 270 h | | | |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Aufbaumodule • Dual-Subject Bachelor's Programme Biology (Bachelor) > Aufbaumodule | | | |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Sascha Laubinger <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Sascha Laubinger | | | |
| Entry requirements | | | | |
| Skills to be acquired in this module | <p>++ biological knowledge ++ knowledge of biological working methods + biologically relevant knowledge in the natural sciences and mathematics + statistics & scientific programming + abstract, logical, analytical thinking + independent learning and (research-based) working + teamwork + (scientific) communication skills</p> | | | |
| Module contents | <p>V: Theoretische Kenntnisse über den Stoffwechsel und die (molekulare) Steuerung der Entwicklung pflanzlicher Organismen, Einführung in die Gentechnik.</p> <p>S: Vorstellung der Experimente, Darstellung der theoretischen Grundlagen der Experimente, Vorstellung aktueller Fachliteratur.</p> <p>Ü: Physiologie von Licht- und Dunkelreaktionen, Photosyntheseleistung und Standortfaktoren. Einfluss von Mineralstoffen auf das Pflanzenwachstum, Funktion des Lichtes als Entwicklungsfaktor, Funktion von Pflanzenhormonen als Entwicklungsfaktoren. Versuche zur molekularen Stressphysiologie. Analyse und Nachweis von gentechnisch veränderten Pflanzen in Lebensmitteln.</p> | | | |
| Reader's advisory | <p>Campbell/Reece: Biologie (Pearson); Schopfer/Brennicke: Pflanzenphysiologie (Springer Spektrum); Buchanan/Gruissem/Jones: Biochemistry and molecular biology of plants (American Society of Plant Physiologists); Heldt/Piechulla: Pflanzenbiochemie (Springer Spektrum).</p> | | | |
| Links | | | | |
| Language of instruction | German | | | |
| Duration (semesters) | 1 Semester | | | |
| Module frequency | jährlich | | | |
| Module capacity | 32 | | | |
| Modullevel | AC (Aufbaucurriculum / Composition) | | | |
| Modulart | Wahlpflicht / Elective | | | |
| Lern-/Lehrform / Type of program | Vorlesung, Seminar, Übung | | | |
| Vorkenntnisse / Previous knowledge | | | | |
| Examination | Time of examination | | Type of examination | |
| Final exam of module | spätestens in der letzten Woche der Vorlesungszeit | | exam | |
| Course type | Comment | SWS | Frequency | Workload attendance |
| Lecture | | 2.00 | SuSe | 28 h |
| Seminar | | 1.00 | SuSe | 14 h |
| Practical | | 4.00 | SuSe | 56 h |
| Total time of attendance for the module | | | | 98 h |

bio295 - Genetics

| | | | | |
|--|---|---|-----------|---------------------|
| Module label | Genetics | | | |
| Module code | bio295 | | | |
| Credit points | 9.0 KP | | | |
| Workload | 270 h | | | |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Aufbaumodule • Dual-Subject Bachelor's Programme Biology (Bachelor) > Aufbaumodule • Master of Education Programme (Special Needs Education) Biology (Master of Education) > Frühere Module | | | |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Maike Claußen <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Maike Claußen ◦ Hans Gerd Nothwang ◦ Anna-Maria Hartmann ◦ Lena Ebbers <p>Module counseling</p> <ul style="list-style-type: none"> ◦ Anna-Maria Hartmann ◦ Hans Gerd Nothwang ◦ Lena Ebbers | | | |
| Entry requirements | | | | |
| Skills to be acquired in this module | <p>++ biological knowledge ++ knowledge of biological working methods + biologically relevant knowledge in the natural sciences and mathematics + abstract, logical, analytical thinking ++ deepened expertise in biological specialist field ++ independent learning and (research-based) working ++ data presentation and evidence-based discussion (written and spoken) + teamwork ++ (scientific) communication skills + project and time management + knowledge of safety and environmental issues</p> <p>Fundamentals of genetics, performing experiments, quantitative analyses.</p> | | | |
| Module contents | general and molecular genetics; mechanisms of mutation, recombination, DNA repair, regulation of transcription; quantitative experiments, prokaryotes and eukaryotes, human genome project, personalized medicine, genetic engineering, safety regulations, sterile working | | | |
| Reader's advisory | Campbell/Reece Biologie (latest edition, Pearson Verlag), Strachan & Read Molekulare Humangenetik (latest edition, Spektrum Verlag); Purves Biologie (latest editdion, Spektrum Verlag). | | | |
| Links | http:// | | | |
| Language of instruction | German | | | |
| Duration (semesters) | 1 Semester | | | |
| Module frequency | jährlich | | | |
| Module capacity | 72 | | | |
| Modullevel | AC (Aufbaucurriculum / Composition) | | | |
| Modulart | Wahlpflicht / Elective | | | |
| Lern-/Lehrform / Type of program | Vorlesung, Seminar, Übung | | | |
| Vorkenntnisse / Previous knowledge | biochemisches und genetisches Grundlagenwissen | | | |
| Examination | Time of examination | Type of examination | | |
| Final exam of module | | Written examination (100%), ungraded presentation, protocol | | |
| Course type | Comment | SWS | Frequency | Workload attendance |
| Lecture | | 1.50 | WiSe | 21 h |
| Exercises | | 3.00 | WiSe | 42 h |
| Seminar | | 1.50 | WiSe | 21 h |
| Total time of attendance for the module | | | | 84 h |

bio240 - Flora and Fauna

| | | | | |
|---|---|---|--|----------------------------|
| Module label | Flora and Fauna | | | |
| Module code | bio240 | | | |
| Credit points | 10.0 KP | | | |
| Workload | 300 h | | | |
| Used in course of study | <ul style="list-style-type: none"> Bachelor's Programme Biology (Bachelor) > Aufbaumodule | | | |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> Dirk Carl Albach Thomas Glatzel <p>Authorized examiners</p> <ul style="list-style-type: none"> Dirk Carl Albach Thomas Glatzel Klaus Bernhard von Hagen <p>Module counseling</p> <ul style="list-style-type: none"> Klaus Bernhard von Hagen | | | |
| Entry requirements | | | | |
| Skills to be acquired in this module | <p>+ biological knowledge + knowledge of biological working methods + independent learning and (research-based) working + knowledge of safety and environmental issues</p> <p>To determine species-rich taxa and to verify the results independently using relevant literature</p> | | | |
| Module contents | <p>L: Introduction to the variety of indigenous flora and fauna, presentation of important plant families and animal groups, studying the characteristics important for determination, introduction to systematics. Moreover, subjects are included that present ecological aspects of the taxa dealt with. E: Applying literature to determine animal and plant species and to classify them systematically. EX: Excursions to the characteristic North German biotopes. The excursions focus on correct identification and classification of plants and animals according to the properties of the living organism.</p> | | | |
| Reader's advisory | <p>Botany: Rothmaler - Exkursionsflora von Deutschland, Band 2 - Grundband, Spektrum Akademischer Verlag</p> <p>Zoology: M. Schaefer: Brohmer - Fauna von Deutschland, from 20th edition</p> | | | |
| Links | | | | |
| Language of instruction | German | | | |
| Duration (semesters) | 2 Semester | | | |
| Module frequency | jährlich | | | |
| Module capacity | unlimited | | | |
| Reference text | Modulverantwortung Teil Fauna (Wintersemester): Dr. Thomas Glatzel Modulverantwortung Teil Flora (Sommersemester): Prof. Dr. Dirk Albach | | | |
| Modullevel | AC (Aufbaucurriculum / Composition) | | | |
| Modulart | Pflicht / Mandatory | | | |
| Lern-/Lehrform / Type of program | | | | |
| Vorkenntnisse / Previous knowledge | | | | |
| Examination | Time of examination | Type of examination | | |
| Final exam of module | Botany: Written examination before the end of the lecture Zoology: Written examination before the end of the lecture | 1 written examination (Botany 50 %) 1 written examination (Zoology 50 %) ungraded minutes | PLEASE NOTE: Additional conditions regarding attendance and ungraded activities as determined by the persons responsible for the module will apply. | |
| Course type | Comment | SWS | Frequency | Workload attendance |
| Lecture | | 2.00 | | 28 h |
| Exercises | | 4.00 | | 56 h |
| Study trip | | 1.00 | | 14 h |

| Course type | Comment | SWS | Frequency | Workload attendance |
|--|---------|-----|-----------|---------------------|
| Total time of attendance for the module | | | | 98 h |

bio260 - General Microbiology

| | | | | |
|--|--|--|------------------|----------------------------|
| Module label | General Microbiology | | | |
| Module code | bio260 | | | |
| Credit points | 10.0 KP | | | |
| Workload | 300 h | | | |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Aufbaumodule | | | |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Ralf Andreas Rabus <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Ralf Andreas Rabus ◦ Erhard Rhiel ◦ Lars Wöhlbrand <p>Module counseling</p> <ul style="list-style-type: none"> ◦ Erhard Rhiel ◦ Lars Wöhlbrand | | | |
| Entry requirements | | | | |
| Skills to be acquired in this module | <p>++ biological knowledge ++ knowledge of biological working methods + biologically relevant knowledge in the natural sciences and mathematics + interdisciplinary knowledge & thinking + abstract, logical, analytical thinking ++ deepened expertise in biological specialist field + independent learning and (research-based) working + data presentation and evidence-based discussion (written and spoken) ++ teamwork + project and time management + knowledge of safety and environmental issues</p> <p>Basic knowledge of microbiology; ability to assess and apply fundamental microbiological techniques.</p> | | | |
| Module contents | Imparting basic microbiological skills and working methods: Chemistry and structure of the cell, fundamentals of metabolism, taxonomy and phylogeny of microorganisms, diversity of microorganisms, insight into Applied Microbiology, propagation of microorganisms. | | | |
| Reader's advisory | Allgemeine Mikrobiologie, Schlegel 1992; Brock-Biology of Microorganisms, eds.: Madigan et al., 2003; Grundlagen der Mikrobiologie, Cypionka, 2003 | | | |
| Links | http://www-icbm.de/~gmb/11429.html | | | |
| Language of instruction | German | | | |
| Duration (semesters) | 1 Semester | | | |
| Module frequency | jährlich | | | |
| Module capacity | unlimited | | | |
| Modullevel | AC (Aufbaucurriculum / Composition) | | | |
| Modulart | Wahlpflicht / Elective | | | |
| Lern-/Lehrform / Type of program | | | | |
| Vorkenntnisse / Previous knowledge | | | | |
| Examination | Time of examination | Type of examination | | |
| Final exam of module | | 1 written examination Protocols | | |
| | | PLEASE NOTE: Additional conditions regarding attendance and ungraded activities as determined by the persons responsible for the module will apply. | | |
| Course type | Comment | SWS | Frequency | Workload attendance |
| Lecture | | 2.00 | | 28 h |
| Seminar | | 1.00 | | 14 h |
| Practical | | 4.00 | | 56 h |
| Total time of attendance for the module | | | | 98 h |

bio270 - Basic Concepts in Animal Physiology

| | | |
|---|---|---|
| Module label | Basic Concepts in Animal Physiology | |
| Module code | bio270 | |
| Credit points | 10.0 KP | |
| Workload | 300 h | |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Aufbaumodule | |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Dominik Heyers <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Dominik Heyers ◦ Christine Köppl ◦ Karin Dedek <p>Module counseling</p> <ul style="list-style-type: none"> ◦ Christine Köppl ◦ Karin Dedek | |
| Entry requirements | | |
| Skills to be acquired in this module | <p>++ biological knowledge ++ knowledge of biological working methods + biologically relevant knowledge in the natural sciences and mathematics + statistics & scientific programming ++ abstract, logical, analytical thinking + deepened expertise in biological specialist field ++ independent learning and (research-based) working + teamwork</p> <p>Basic knowledge on physiological processes and their underlying mechanisms with a focus on human physiology. Performing, analysing and documenting physiological experiments.</p> | |
| Module contents | <p>The lecture (Vorlesung: 5.02.271 - Physiologie der Tiere und des Menschen) covers topics such as cell physiology, sensory physiology, neurophysiology, functions of the vegetative system, blood physiology/immune response, blood cycle, respiration and digestion. Emphasis will be on human physiology. In the following lab exercises, students get the opportunity to perform physiological experiments linking to topics from the lecture. By performing experiments on themselves and computer simulations students will gain insight into the underlying physiological principles.</p> | |
| Reader's advisory | <p>Klinke, Pape, Kurtz, Silbernagl: Physiologie, Aufl. 6, 2010 Schmidt, Lang, Heckmann: Physiologie des Menschen mit Pathophysiologie, Aufl. 31, 2011 (if available: Wehner, Gehring: Zoologie)</p> | |
| Links | | |
| Language of instruction | German | |
| Duration (semesters) | 1 Semester | |
| Module frequency | jährlich | |
| Module capacity | unlimited | |
| Modullevel | AC (Aufbaucurriculum / Composition) | |
| Modulart | Wahlpflicht / Elective | |
| Lern-/Lehrform / Type of program | | |
| Vorkenntnisse / Previous knowledge | | |
| Examination | Time of examination | Type of examination |
| Final exam of module | within a few weeks after the winter term lecture period | written exam (100%) |
| | | To qualify for the exam, the following additional requirements need to be met: |
| | | <ul style="list-style-type: none"> • regular participation in the laboratory experiments (no more than 1 day of absence) • lab protocols for each experiment which have been accepted by the respective supervisors |
| | | A cumulative bonus can be obtained with good lab |

| Examination | Time of examination | Type of examination | | |
|--|---------------------|--|-----------|---------------------|
| | | <p>protocols. The decision whether a given protocol deserves the bonus lies with the respective supervisor of each experiment.</p> <p>The bonus improves the exam mark by maximally two steps (0.7). The bonus is optional, an exam mark of 1.0 is achievable without a bonus. A bonus cannot be applied to pass a failed exam.</p> <p>PLEASE NOTE: Additional conditions regarding attendance and ungraded activities as determined by the persons responsible for the module will apply.</p> | | |
| Course type | Comment | SWS | Frequency | Workload attendance |
| Lecture | | 4.00 | | 56 h |
| Exercises | | 3.00 | | 42 h |
| Total time of attendance for the module | | | | 98 h |

bio280 - Plant Physiology

| | | | | |
|---|--|---|------------------|----------------------------|
| Module label | Plant Physiology | | | |
| Module code | bio280 | | | |
| Credit points | 10.0 KP | | | |
| Workload | 300 h | | | |
| Used in course of study | <ul style="list-style-type: none"> Bachelor's Programme Biology (Bachelor) > Aufbaumodule | | | |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> Sascha Laubinger <p>Authorized examiners</p> <ul style="list-style-type: none"> Sascha Laubinger Gerhard Wolfgang Zotz <p>Module counseling</p> <ul style="list-style-type: none"> Gerhard Wolfgang Zotz | | | |
| Entry requirements | | | | |
| Skills to be acquired in this module | <p>++ biological knowledge ++ knowledge of biological working methods + biologically relevant knowledge in the natural sciences and mathematics + statistics & scientific programming + abstract, logical, analytical thinking + independent learning and (research-based) working + teamwork + (scientific) communication skills</p> <p>Fundamentals of metabolism and developmental physiology of plants. Theoretical knowledge acquired from lectures and textbooks is improved by experiments, the instructions for experiments are applied independently, laboratory device is handled independently, measured values are calculated independently, the correctness of experimental results is assessed, the results obtained are interpreted and compared to theoretical expectations.</p> | | | |
| Module contents | <p>L: Theoretical knowledge of metabolism and of the control of development in plant organisms, introduction to genetic engineering. S: Presentation of experiments, presentation of theoretical fundamentals of experiments. L: Photosynthesis: Physiology of light and dark reactions, photosynthetic ability and environmental factors. Ecophysiology: Influence of mineral substances on plant growth, function of light as developmental factor, function of plant hormones as developmental factors.</p> | | | |
| Reader's advisory | <p>Campbell: Biologie; Taiz/Zeiger: Physiologie der Pflanzen (Verlag Spektrum); Buchanan/Gruissem/Jones: Biochemistry and molecular biology of plants (American Society of Plant Physiologists); Kutschera: Prinzipien der Pflanzenphysiologie (Spektrum Akademischer Verlag).</p> | | | |
| Links | | | | |
| Language of instruction | German | | | |
| Duration (semesters) | 1 Semester | | | |
| Module frequency | jährlich | | | |
| Module capacity | unlimited | | | |
| Modullevel | AC (Aufbaucurriculum / Composition) | | | |
| Modulart | Wahlpflicht / Elective | | | |
| Lern-/Lehrform / Type of program | | | | |
| Vorkenntnisse / Previous knowledge | | | | |
| Examination | Time of examination | Type of examination | | |
| Final exam of module | in the final week of the semester at the latest | Records | | |
| | | <p>PLEASE NOTE: Additional conditions regarding attendance and ungraded activities as determined by the persons responsible for the module will apply.</p> | | |
| Course type | Comment | SWS | Frequency | Workload attendance |
| Lecture | | 2.00 | | 28 h |
| Seminar | | 1.00 | | 14 h |
| Practical | | 4.00 | | 56 h |

| Course type | Comment | SWS | Frequency | Workload attendance |
|--|---------|-----|-----------|---------------------|
| Total time of attendance for the module | | | | 98 h |

bio290 - Genetics

| | | | | |
|---|---|---|------------------|----------------------------|
| Module label | Genetics | | | |
| Module code | bio290 | | | |
| Credit points | 10.0 KP | | | |
| Workload | 300 h | | | |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Aufbaumodule | | | |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Maike Claußen <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Maike Claußen ◦ Hans Gerd Nothwang ◦ Anna-Maria Hartmann <p>Module counseling</p> <ul style="list-style-type: none"> ◦ Hans Gerd Nothwang ◦ Anna-Maria Hartmann | | | |
| Entry requirements | | | | |
| Skills to be acquired in this module | <p>++ biological knowledge ++ knowledge of biological working methods + biologically relevant knowledge in the natural sciences and mathematics + abstract, logical, analytical thinking ++ deepened expertise in biological specialist field ++ independent learning and (research-based) working ++ data presentation and evidence-based discussion (written and spoken) + teamwork ++ (scientific) communication skills + project and time management + knowledge of safety and environmental issues</p> <p>Fundamentals of genetics, performing experiments, quantitative analyses.</p> | | | |
| Module contents | <p>general and molecular genetics; mechanisms of mutation, recombination, DNA repair, regulation of transcription; quantitative experiments, prokaryotes and eukaryotes, human genome project, personalized medicine, genetic engineering, safety regulations, sterile working</p> | | | |
| Reader's advisory | <p>Campbell/Reece Biologie (latest edition, Pearson Verlag), Strachan & Read Molekulare Humangenetik (latest edition, Spektrum Verlag); Purves Biologie (latest edition, Spektrum Verlag).</p> | | | |
| Links | | | | |
| Language of instruction | German | | | |
| Duration (semesters) | 1 Semester | | | |
| Module frequency | jährlich | | | |
| Module capacity | unlimited | | | |
| Modullevel | AC (Aufbaucurriculum / Composition) | | | |
| Modulart | Pflicht o. Wahlpflicht / compulsory or optional | | | |
| Lern-/Lehrform / Type of program | | | | |
| Vorkenntnisse / Previous knowledge | | | | |
| Examination | Time of examination | Type of examination | | |
| Final exam of module | | <p>Written examination (100%) ungraded presentation ungraded protocol</p> <p>PLEASE NOTE: Additional conditions regarding attendance and ungraded activities as determined by the persons responsible for the module will apply.</p> | | |
| Course type | Comment | SWS | Frequency | Workload attendance |
| Lecture | | 1.00 | | 14 h |
| Exercises | | 0.00 | WiSe | 0 h |
| Seminar | | 1.00 | | 14 h |

| Course type | Comment | SWS | Frequency | Workload attendance |
|--|---------|------|-----------|---------------------|
| Practical | | 4.00 | WiSe | 56 h |
| Total time of attendance for the module | | | | 84 h |

Akzentsetzungsmodule

bio300 - Evolutionary Biology

| | | |
|---|---|--|
| Module label | Evolutionary Biology | |
| Module code | bio300 | |
| Credit points | 15.0 KP | |
| Workload | 450 h | |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Dual-Subject Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Master of Education Programme (Gymnasium) Biology (Master of Education) > Mastermodule | |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Olaf Bininda-Emonds ◦ Wilko Ahlrichs ◦ Dirk Carl Albach ◦ Gabriele Gerlach ◦ Arne Nolte <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Olaf Bininda-Emonds ◦ Wilko Ahlrichs ◦ Dirk Carl Albach ◦ Gabriele Gerlach ◦ Arne Nolte | |
| Entry requirements | | |
| Skills to be acquired in this module | <p>++ biological knowledge + knowledge of biological working methods ++ biologically relevant knowledge in the natural sciences and mathematics + statistics & scientific programming + interdisciplinary knowledge & thinking + abstract, logical, analytical thinking ++ deepened expertise in biological specialist field + independent learning and (research-based) working ++ data presentation and evidence-based discussion (written and spoken) + teamwork ++ (scientific) communication skills + project and time management</p> <p>Introduction to both microevolution (speciation and species concepts, adaptation and selection, behavioural ecology, reproduction systems) and macroevolution. Introduction to phylogenetics (phyloinformatics, molecular systematics, phylogeography).</p> | |
| Module contents | <p>The lecture imparts basic knowledge in areas including population biology, phylogenetic systematics, phyloinformatics, behavioural and reproduction ecology. These fundamentals are extended in the seminar and exercises.</p> | |
| Reader's advisory | <p>Freeman, S. and C.J. Herron. 2007. Evolutionary analysis. 4th edition. 800 pp.; Futuyma, D.J. 2007. Evolution. The original with translation. Spektrum Akademischer Verlag. 607 pp.; Knoop, V. and K. Müller. 2009. Gene und Stammbäume: ein Handbuch zur molekularen Phylogenetik. 2. Auflage. Spektrum Akademischer Verlag. 386 pp.; Zrzavy, J., D. Storch, and S. Mihulka. 2009. Evolution: ein Lese-Lehrbuch. Spektrum Akademischer Verlag. 493 pp</p> | |
| Links | | |
| Language of instruction | German | |
| Duration (semesters) | 1 Semester | |
| Module frequency | jährlich | |
| Module capacity | unlimited | |
| Modullevel | AS (Akzentsetzung / Accentuation) | |
| Modulart | Wahlpflicht / Elective | |
| Lern-/Lehrform / Type of program | | |
| Vorkenntnisse / Previous knowledge | | |
| Examination | Time of examination | Type of examination |
| Final exam of module | Written examination in the final week of the semester or in the first week following the lecture | Written examination (60%) Portfolio (40%) |

| Examination | | Time of examination period. | Type of examination | |
|--|---------|--------------------------------|--|---------------------|
| | | | PLEASE NOTE: Additional conditions regarding attendance and ungraded activities as determined by the persons responsible for the module will apply. | |
| Course type | Comment | SWS | Frequency | Workload attendance |
| Lecture | | 2.00 | | 28 h |
| Exercises | | 6.00 | | 84 h |
| Seminar | | 2.00 | | 28 h |
| Total time of attendance for the module | | | | 140 h |

bio310 - General Ecology

| | |
|---|--|
| Module label | General Ecology |
| Module code | bio310 |
| Credit points | 15.0 KP |
| Workload | 450 h |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Dual-Subject Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Master of Education Programme (Gymnasium) Biology (Master of Education) > Mastermodule |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Helmut Hillebrand <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Helmut Hillebrand ◦ Rolf Niedringhaus ◦ Rainer Buchwald ◦ Gerhard Wolfgang Zotz ◦ Peter Schupp ◦ Sven Rohde ◦ Maren Striebel <p>Module counseling</p> <ul style="list-style-type: none"> ◦ Rolf Niedringhaus ◦ Rainer Buchwald ◦ Gerhard Wolfgang Zotz ◦ Peter Schupp ◦ Sven Rohde ◦ Maren Striebel |
| Entry requirements | Bestandene Pflichtmodule des Kerncurriculums |
| Skills to be acquired in this module | <p>++ biological knowledge</p> <p>++ knowledge of biological working methods</p> <p>++ biologically relevant knowledge in the natural sciences and mathematics</p> <p>+ statistics & scientific programming</p> <p>+ interdisciplinary knowledge & thinking</p> <p>++ abstract, logical, analytical thinking</p> <p>+ deepened expertise in biological specialist field</p> <p>+ independent learning and (research-based) working</p> <p>+ data presentation and evidence-based discussion (written and spoken)</p> <p>+ (scientific) communication skills</p> |
| Module contents | <p>Allgemeine Ökologie VL (Hillebrand) 2 SWS, 3 KP; Präsenzzeit 21 h, Nachbereitungszeit 69 h; im Wintersemester</p> <p>Theoretische Grundlagen, Ressourcen, Populationsökologie, biologische Interaktionen, Lebensgemeinschaften, Ökosysteme</p> <p>PR/S, 4 SWS, 6 KP; Präsenzzeit 42 h, Nachbereitungszeit 138 h; im folgenden Sommersemester</p> <p>B.Sc. Biologie: alternativ 2 aus 5 Wahlpraktika</p> <p>B.Sc. Umweltwissenschaften: alternativ 1 aus 5 Wahlpraktika</p> <p>PR/S Vegetationsökologie / Naturschutz (Buchwald)</p> <p>Vegetationskundliche Aufnahmemethoden (Artenzusammensetzung, Struktur), Nährstoffverhältnisse des Oberbodens, Mikroklima, Naturschutzprojekte</p> <p>PR/S Zoo-Ökologie (Niedringhaus)</p> <p>Repräsentative Fragestellungen der (terrestrischen) Freiland-Ökologie, Problematik von Erfassungsmethoden sowie der Einfluss abiotischer und biotischer Faktoren auf Struktur und Dynamik von Populationen, Arbeiten im Freiland, Auswertungen im Labor</p> <p>PR/SE Funktionelle Ökologie der Pflanzen (Zotz, Bader)</p> <p>Analyse abiotischer Rahmenbedingungen (u.a. Mikroklima), Wasser-, Nährstoff-, Kohlenstoffhaushalt, Aspekte der Populationsbiologie, Analyse von Pflanzenbeständen (Struktur, Funktion), statistische Auswertung und Modellierung</p> <p>PR/S Aquatische Ökologie (Hillebrand, Moorthi)</p> <p>Experimentelle Analyse von Artwechselwirkungen, zum Beispiel Räuber-Beute und Konkurrenz. Experimentelles Design. Auswertung von Proben, Biomassebestimmungen, Auszählungen, Mikroskopie. Statistische Analyse. Schreiben unter wissenschaftlicher Publikationsnorm</p> <p>PR/S Benthische Ökologie (Schupp, Rohde)</p> <p>Experimentelle Analyse abiotischer und biotischer Faktoren auf makrobenthische Organismen und</p> |

Gemeinschaften. Salinitäts- und Temperatureinflüsse, Räuber-Beute Beziehungen, Konkurrenzeffekte, statistische Auswertung und Verfassung wissenschaftlicher Berichte.
S Gemeinsames Symposium zu den Praktikumsergebnissen (O-Woche des folgenden Wintersemesters), 4h.

| | |
|--------------------------|---|
| Reader's advisory | <p>VL Allgemeine Ökologie Nentwig, W., Bacher, S., Brandl, R., 2007. Ökologie kompakt. Spektrum Akademischer Verlag, Heidelberg. Vorlesungsunterlagen (Stud-IP)</p> <p>Vegetationsökologie / Naturschutz</p> <p>Zoo-Ökologie Nentwig et al., 2004. Ökologie. Spektrum Lehrbuch, Heidelberg. 466 S. Southwood, T.R.E. & P.A. Henderson 2000: Ecological Methods. Blackwell Science, Oxford. 574 S.</p> <p>Funktionelle Ökologie der Pflanzen Lambers, H., F. S. Chapin , & T. L. Pons. 2008. Plant Physiological Ecology. New York, Springer Verlag.</p> <p>Aquatische Ökologie Lampert, Sommer 1999: Limnoökologie. Thieme Praktikumskript</p> <p>Benthische Ökologie Sommer, U., 2005. Biologische Meereskunde. Springer</p> |
|--------------------------|---|

| | |
|---|--|
| Links | |
| Language of instruction | German |
| Duration (semesters) | 2 Semester |
| Module frequency | jährlich |
| Module capacity | unlimited |
| Modullevel | AS (Akzentsetzung / Accentuation) |
| Modulart | Wahlpflicht / Elective |
| Lern-/Lehrform / Type of program | <p>V (2 SWS) , S (1 SWS) , PR (3 SWS) VL Ökologie (3 KP) Alternativ 2 aus 5 Wahlpraktika (5+1 KP): PR/SE Vegetationsökologie/Naturschutz PR/SE Funktionelle Ökologie der Pflanzen PR/SE Zoo-Ökologie PR/SE Aquatische Ökologie PR/SE Benthische Ökologie</p> |

| | | |
|---|--|---|
| Vorkenntnisse / Previous knowledge | | |
| Examination | Time of examination | Type of examination |
| Final exam of module | <p>VL: Ende des Wintersemesters PR: Ende des jeweiligen Praktikumblockes</p> | <p>2 Prüfungsleistungen: 1) Prüfung zur Vorlesung (Klausur; 30%) im 1. Semester des Moduls sowie 2) Portfolio zum Praktikum (Portfolio; 70%) im 2. Semester des Moduls Zum Bestehen des Moduls müssen alle Teilleistungen bestanden sein.</p> <p>Voraussetzung für die Vergabe von Kreditpunkten ist die aktive Teilnahme an: Seminar und Praktikum</p> |

| Course type | Comment | SWS | Frequency | Workload attendance |
|--|---------|------|-----------|---------------------|
| Lecture | | 2.00 | | 28 h |
| Seminar | | 1.00 | | 14 h |
| Practical | | 3.00 | | 42 h |
| Total time of attendance for the module | | | | 84 h |

bio325 - Pollination and Dispersal - Concepts

| | | | | |
|--|---|------------|---------------------|----------------------------|
| Module label | Pollination and Dispersal - Concepts | | | |
| Module code | bio325 | | | |
| Credit points | 6.0 KP | | | |
| Workload | 180 h | | | |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Bachelor's Programme Mathematics (Bachelor) > Nebenfachmodule • Dual-Subject Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Master of Education Programme (Gymnasium) Biology (Master of Education) > Mastermodule | | | |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Dirk Carl Albach <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Dirk Carl Albach ◦ Klaus Bernhard von Hagen ◦ Maria Will <p>Module counseling</p> <ul style="list-style-type: none"> ◦ Klaus Bernhard von Hagen ◦ Maria Will | | | |
| Entry requirements | bio256 Flora and Fauna | | | |
| Skills to be acquired in this module | <p>+ biological knowledge + knowledge of biological working methods + abstract, logical, analytical thinking + deepened expertise in biological specialist field + independent learning and (research-based) working + data presentation and evidence-based discussion (written and spoken) + teamwork + (scientific) communication skills + project and time management + knowledge of safety and environmental issues</p> <p>Extended knowledge of biodiversity and evolution of plants focusing on reproduction, dispersal, germination and establishment of plants</p> | | | |
| Module contents | <p>L: Pollination, dispersal, germination of plants, plant breeding S: Pollination and dispersal biology of plants in a systematic context</p> | | | |
| Reader's advisory | The course does not follow a special textbook. The following German literature is recommended to students interested in the course: Dieter Heß – Die Blüte, Eugen Ulmer Verlag as well as Leins & Erbar -Blüte und Frucht, Schweizerbart'sche Verlagsbuchhandlung. | | | |
| Links | | | | |
| Language of instruction | German | | | |
| Duration (semesters) | 1 Semester | | | |
| Module frequency | The module will be offered every other year | | | |
| Module capacity | 12 | | | |
| Modullevel | AS (Akzentsetzung / Accentuation) | | | |
| Modulart | Wahlpflicht / Elective | | | |
| Lern-/Lehrform / Type of program | Vorlesung, Seminar | | | |
| Vorkenntnisse / Previous knowledge | | | | |
| Examination | Time of examination | | Type of examination | |
| Final exam of module | | | portfolio | |
| Course type | Comment | SWS | Frequency | Workload attendance |
| Lecture | | 2.00 | SuSe | 28 h |
| Seminar | | 2.00 | SuSe | 28 h |
| Total time of attendance for the module | | | | 56 h |

bio326 - Pollination and Dispersal - Methods

| | | |
|---|---|---------------------|
| Module label | Pollination and Dispersal - Methods | |
| Module code | bio326 | |
| Credit points | 6.0 KP | |
| Workload | 180 h | |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Bachelor's Programme Mathematics (Bachelor) > Nebenfachmodule • Dual-Subject Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule | |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Dirk Carl Albach <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Dirk Carl Albach ◦ Klaus Bernhard von Hagen ◦ Maria Will <p>Module counseling</p> <ul style="list-style-type: none"> ◦ Klaus Bernhard von Hagen ◦ Maria Will | |
| Entry requirements | bio325 Pollination and dispersal concepts bio256 Flora/Fauna | |
| Skills to be acquired in this module | <p>+ biological knowledge + knowledge of biological working methods + abstract, logical, analytical thinking + deepened expertise in biological specialist field + independent learning and (research-based) working + data presentation and evidence-based discussion (written and spoken) + teamwork + (scientific) communication skills + project and time management + knowledge of safety and environmental issues</p> <p>Extended knowledge of biodiversity and evolution of plants focusing on reproduction, dispersal, germination and establishment of plants</p> | |
| Module contents | Pollination, fertilisation, dispersal and germination biological experiments in regard of adaptation to environmental factors | |
| Reader's advisory | The course does not follow a special textbook. The following German literature is recommended to students interested in the course: Dieter Heß – Die Blüte, Eugen Ulmer Verlag as well as Leins & Erbar -Blüte und Frucht, Schweizerbart'sche Verlagsbuchhandlung. | |
| Links | | |
| Language of instruction | German | |
| Duration (semesters) | 1 Semester | |
| Module frequency | The module will be offered every other year | |
| Module capacity | 12 | |
| Modullevel | AS (Akzentsetzung / Accentuation) | |
| Modulart | Wahlpflicht / Elective | |
| Lern-/Lehrform / Type of program | Übung | |
| Vorkenntnisse / Previous knowledge | | |
| Examination | Time of examination | Type of examination |
| Final exam of module | | Portfolio |
| Course type | Exercises | |
| SWS | 4.00 | |
| Frequency | SuSe | |
| Workload attendance | 56 h | |

bio327 - Pollination and Dispersal - Methods not just for Schools

| | | |
|---|--|---------------------|
| Module label | Pollination and Dispersal - Methods not just for Schools | |
| Module code | bio327 | |
| Credit points | 9.0 KP | |
| Workload | 270 h | |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Bachelor's Programme Mathematics (Bachelor) > Nebenfachmodule • Dual-Subject Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Master of Education Programme (Gymnasium) Biology (Master of Education) > Mastermodule | |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Dirk Carl Albach <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Dirk Carl Albach ◦ Klaus Bernhard von Hagen ◦ Maria Will <p>Module counseling</p> <ul style="list-style-type: none"> ◦ Klaus Bernhard von Hagen ◦ Maria Will | |
| Entry requirements | bio325 Pollination and dispersal concepts bio256 Flora/fauna | |
| Skills to be acquired in this module | <ul style="list-style-type: none"> + biological knowledge + knowledge of biological working methods + abstract, logical, analytical thinking + deepened expertise in biological specialist field + independent learning and (research-based) working + data presentation and evidence-based discussion (written and spoken) + teamwork + (scientific) communication skills + project and time management + knowledge of safety and environmental issues <p>Extended knowledge of biodiversity and evolution of plants focusing on reproduction, dispersal, germination and establishment of plants</p> | |
| Module contents | The module introduces methods to study pollination, fertilisation, dispersal and germination in regard of adaptation to environmental factors. Experiments applicable to school lessons will be presented and especially thoroughly discussed. | |
| Reader's advisory | The course does not follow a special textbook. The following German literature is recommended to students interested in the course: Dieter Heß – Die Blüte, Eugen Ulmer Verlag as well as Leins & Erbar -Blüte und Frucht, Schweizerbart'sche Verlagsbuchhandlung. | |
| Links | | |
| Language of instruction | German | |
| Duration (semesters) | 1 Semester | |
| Module frequency | Das Modul wird alle zwei Jahre stattfinden. | |
| Module capacity | 12 | |
| Modullevel | AS (Akzentsetzung / Accentuation) | |
| Modulart | Wahlpflicht / Elective | |
| Lern-/Lehrform / Type of program | Übung | |
| Vorkenntnisse / Previous knowledge | | |
| Examination | Time of examination | Type of examination |
| Final exam of module | portfolio | |
| Course type | Exercises | |
| SWS | 6.00 | |
| Frequency | SuSe | |
| Workload attendance | 84 h | |

bio330 - Marine Ecology

| | |
|---|--|
| Module label | Marine Ecology |
| Module code | bio330 |
| Credit points | 15.0 KP |
| Workload | 450 h |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodul • Dual-Subject Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodul • Master of Education Programme (Gymnasium) Biology (Master of Education) > Mastermodule |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Helmut Hillebrand <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Helmut Hillebrand ◦ Stefanie Moorthi <p>Module counseling</p> <ul style="list-style-type: none"> ◦ Stefanie Moorthi |
| Entry requirements | |
| Skills to be acquired in this module | <p>++ biological knowledge ++ knowledge of biological working methods ++ biologically relevant knowledge in the natural sciences and mathematics + statistics & scientific programming + interdisciplinary knowledge & thinking ++ abstract, logical, analytical thinking ++ deepened expertise in biological specialist field ++ independent learning and (research-based) working ++ data presentation and evidence-based discussion (written and spoken) + teamwork ++ (scientific) communication skills + project and time management</p> <p>Basic knowledge and practical experience in biological oceanography Apply theoretical concepts from different fields in marine ecology Analyse, present, and interpret results from the marine ecological literature and own investigations Acknowledge the importance of general ecological concepts for ecosystem management Gain experience in the application of field and lab methods in ecology</p> |
| Module contents | <p>Lecture Biological Oceanography 2 SWS = 3 CP. Presence time 24 h, additional study time 66h, winter-term Abiotic environmental conditions in marine systems (light, temperature, chemical and physical properties of the water, waves, tides, global distribution of water masses and currents. Pelagic communities, plankton (phyt-, zoo-, bacterio-, viroplankton), microbial loop, sedimentation, C-and N cycling, Nekton, Fisheries, El Nino, Benthic communities, estuaries.</p> <p>Exercise Concepts in marine ecology 6 SWS = 9 CP. Presence time 70 h, additional study time 200h, winter-term Practical and theoretical exercises on marine ecology, including field studies, experiments and working with case studies from the literature. The focus is on concepts here, pinpointing at general ecological frameworks.</p> <p>Lecture Marine Ecology 2 SWS = 3 CP. Presence time 24 h, additional study time 66h, winter-term Ecology of marine systems: estuaries, rocky and sediment coasts, pelagial, shelves, mangroves, seagrass meadows, coral reefs, deep sea, polar regions. The focus is on ecological specifics and interactions in the biotic communities of these systems. The second half of the lecture will focus on importance and consequences of overfishing, habitat destruction, pollution, climate change and bioinvasion on marine systems.</p> |
| Reader's advisory | C.M. Lalli, T.R. Parsons, Biological Oceanography: An Introduction, Elsevier, Oxford. U. Sommer, Biologische Meereskunde, Springer Verlag, Heidelberg. |
| Links | |
| Language of instruction | German |
| Duration (semesters) | 2 Semester |
| Module frequency | jährlich |
| Module capacity | unlimited |
| Modullevel | AS (Akzentsetzung / Accentuation) |
| Modulart | Wahlpflicht / Elective |

Lern-/Lehrform / Type of program

Vorkenntnisse / Previous knowledge

| Examination | Time of examination | Type of examination | | |
|--|---|---|-----------|---------------------|
| Final exam of module | Written exam at the end of the Lecture Marine Ecology | 1 written exam (Lecture) (50%), 1 oral presentation (Exercise) (50%) PLEASE NOTE: Additional conditions regarding attendance and ungraded activities as determined by the persons responsible for the module will apply. | | |
| Course type | Comment | SWS | Frequency | Workload attendance |
| Lecture | | 4.00 | | 56 h |
| Exercises | | 6.00 | | 84 h |
| Total time of attendance for the module | | | | 140 h |

bio340 - Morphology, Phylogeny, and Evolution of Metazoa

| | | |
|---|---|--|
| Module label | Morphology, Phylogeny, and Evolution of Metazoa | |
| Module code | bio340 | |
| Credit points | 15.0 KP | |
| Workload | 450 h | |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Dual-Subject Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Master of Education Programme (Gymnasium) Biology (Master of Education) > Mastermodule | |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Olaf Bininda-Emonds <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Olaf Bininda-Emonds ◦ Wilko Ahlrichs <p>Module counseling</p> <ul style="list-style-type: none"> ◦ Wilko Ahlrichs | |
| Entry requirements | | |
| Skills to be acquired in this module | <p>++ biological knowledge + knowledge of biological working methods ++ biologically relevant knowledge in the natural sciences and mathematics + statistics & scientific programming + interdisciplinary knowledge & thinking + abstract, logical, analytical thinking ++ deepened expertise in biological specialist field + independent learning and (research-based) working ++ data presentation and evidence-based discussion (written and spoken) + teamwork ++ (scientific) communication skills + project and time management</p> <p>Upon successful completion of the module the students will gain:</p> <ol style="list-style-type: none"> 1. a survey of topical subjects relating to the morphology and phylogeny of animals, 2. a thorough knowledge of the development of morphological characteristics, 3. technical skills in studying morphological structures, and 4. knowledge into recent hypotheses on the phylogeny of animals. | |
| Module contents | <p>Lecture: Details regarding the morphology and evolution of Metazoa from an explicit phylogenetic framework Seminar: Presentation and discussion of recent subjects and issues relating to the evolution of Metazoa; presentation of individual metazoan taxa Exercise: Preparation and documentation of exemplary species of Metazoa; various field studies (e.g. visit to the Dierenpark Emmen or to the Zoo am Meer (Bremerhaven), sampling aquatic micrometazoans, observing birds)</p> | |
| Reader's advisory | Relevant literature will be announced during the first seminar and is contingent on the latest developments in the research field. | |
| Links | | |
| Language of instruction | German | |
| Duration (semesters) | 1 Semester | |
| Module frequency | jährlich | |
| Module capacity | unlimited | |
| Modullevel | AS (Akzentsetzung / Accentuation) | |
| Modulart | Wahlpflicht / Elective | |
| Lern-/Lehrform / Type of program | | |
| Vorkenntnisse / Previous knowledge | | |
| Examination | Time of examination | Type of examination |
| Final exam of module | Portfolio during the course of the seminar; written examination in the final week of the course or in the first week following the lecture period. | 1 Written examination (50%), 1 Portfolio (50%), PLEASE NOTE: Additional conditions regarding attendance and ungraded activities as determined by the persons responsible for the module will apply. |

| Course type | Comment | SWS | Frequency | Workload attendance |
|--|---------|------|-----------|---------------------|
| Lecture | | 2.00 | | 28 h |
| Exercises | | 5.00 | | 70 h |
| Seminar | | 2.00 | | 28 h |
| Total time of attendance for the module | | | | 126 h |

bio355 - Microscopical Anatomy

| | | |
|---|---|---------------------|
| Module label | Microscopical Anatomy | |
| Module code | bio355 | |
| Credit points | 9.0 KP | |
| Workload | 270 h | |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Bachelor's Programme Mathematics (Bachelor) > Nebenfachmodule • Dual-Subject Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Master of Education Programme (Gymnasium) Biology (Master of Education) > Mastermodule | |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Wilko Ahlrichs <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Wilko Ahlrichs ◦ Alexander Kieneke ◦ Mona Hoppenrath <p>Module counseling</p> <ul style="list-style-type: none"> ◦ Alexander Kieneke ◦ Mona Hoppenrath | |
| Entry requirements | | |
| Skills to be acquired in this module | <p>++ biological knowledge ++ knowledge of biological working methods ++ biologically relevant knowledge in the natural sciences and mathematics + interdisciplinary knowledge & thinking ++ abstract, logical, analytical thinking ++ deepened expertise in biological specialist field ++ independent learning and (research-based) working ++ data presentation and evidence-based discussion (written and spoken) + teamwork ++ (scientific) communication skills + project and time management + knowledge of safety and environmental issues</p> <p>This course is designed for students to learn about the basic light and electron optical methods. Students will be able to work with preparative techniques for scanning electron microscopy, transmission electron microscopy, and light microscopy, and confocal scanning laser microscopy. Students completing this course will have learned basic principles for fixing and embedding biological materials for electron microscopy. Students will have learned how to operate a transmission electron microscope, a scanning electron microscope, several ultramicrotomes, a vacuum evaporator, a critical point dryer, and a sputter coater. Digital imaging techniques that will be learned will include print making, design and assembly of materials for publication, PowerPoint presentations, and poster design. Students will be introduced to the principles of light microscopy utilizing different optical systems and will have the opportunity to have hands-on experience with a Leica photomicroscope as well as the Leica SP5 confocal laser scanning.</p> | |
| Module contents | Microscopy of protists and micro metazoans. Students are required plan and carry out a research project that exposes them to some of the challenges and problems encountered by microscopical anatomy - and some of the techniques that are used to solve these problems. Students have to present a scientific poster, a short oral presentation and a scientific paper. | |
| Reader's advisory | Will be announced in the course. | |
| Links | | |
| Language of instruction | German | |
| Duration (semesters) | 1 Semester | |
| Module frequency | annually | |
| Module capacity | 8 (For more applicants than places, a motivation letter decides on the admission.) | |
| Modullevel | AS (Akzentsetzung / Accentuation) | |
| Modulart | Wahlpflicht / Elective | |
| Lern-/Lehrform / Type of program | Vorlesung/Seminar, Übung | |
| Vorkenntnisse / Previous knowledge | | |
| Examination | Time of examination | Type of examination |

| Examination | | Time of examination | Type of examination | | |
|--|---------|---------------------|---------------------|---------------------|--|
| Final exam of module | | end of module | portfolio | | |
| Course type | Comment | SWS | Frequency | Workload attendance | |
| Vorlesung und Seminar | | 2.00 | WiSe | 28 h | |
| Exercises | | 3.50 | WiSe | 49 h | |
| Total time of attendance for the module | | | | 77 h | |

bio360 - Marine Biodiversity

| | |
|---|--|
| Module label | Marine Biodiversity |
| Module code | bio360 |
| Credit points | 15.0 KP |
| Workload | 450 h |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Dual-Subject Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Master of Education Programme (Gymnasium) Biology (Master of Education) > Mastermodule |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Thomas Glatzel <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Thomas Glatzel ◦ Pedro Miguel Martinez Arbizu ◦ Mona Hoppenrath <p>Module counseling</p> <ul style="list-style-type: none"> ◦ Pedro Miguel Martinez Arbizu ◦ Mona Hoppenrath |
| Entry requirements | |
| Skills to be acquired in this module | <p>++ biological knowledge ++ knowledge of biological working methods + interdisciplinary knowledge & thinking + abstract, logical, analytical thinking ++ deepened expertise in biological specialist field ++ independent learning and (research-based) working ++ data presentation and evidence-based discussion (written and spoken) + teamwork + (scientific) communication skills + project and time management</p> <p>By active participation the students acquire the following knowledge/abilities/qualification:</p> <ul style="list-style-type: none"> * Preparation and organization of sampling * Keeping organisms – field study * Marine deposits, development of marine sediments and their effects on the fauna * Methods of meiofauna and macrofauna sampling, also plankton sampling * Methods of quantitative community analysis * Diversity comparison of various sites applying statistical methods * Multivariate statistics for correlation of biocenoses and environmental variables * Biocenoses of marine habitats * Biology, morphology, systematics, behaviour and ecology of selected taxa in marine water systems * Formulation and definition of scientific questions and selection of methods * Habitat and biocenoses, interstitial, littoral (lotic, lenitic), diversity * Planning behavioural experiments * Presentation and discussion of scientific results * Independent scientific work in groups and presentation of results |
| Module contents | <p>The module gives an introduction to marine biodiversity research demonstrated by various animal groups from the Wadden Sea and the North Sea including independent sampling on the coast and on the islands. The students will collect the organisms in the field or on board using sampling equipment. In the laboratory course, the biology and morphology as well as the ecology and behaviour of certain species are investigated and documented. The morphology of marine sediments and their development are further aspects of this module.</p> |
| Reader's advisory | <p>Literatur: EMSCHERMANN, P., HOFRICHTER, O., KÖRNER, H. & D., ZISSLER, 1992: Meeresbiologische Exkursion – Beobachtung und Experiment. Gustav Fischer Verlag, Stuttgart, Jena, New York. GIÈRE, O., 2009: Meiofauna – The Microscopic Motile Fauna of Aquatic Sediments. Springer Verlag, Berlin-Heidelberg. GRZIMEK, B., 1979: Grzimeks Tierleben. 13 Bände. Dtv. GRUNER, H.-E., 1993: Urania Tierreich. 6 Bände. Urania-Verlag Leipzig, Jena, Berlin. GRUNER, H.-E., 1993: „Der Kaestner“, A., Lehrbuch der speziellen Zoologie. All volumes, Gustav Fischer Verlag, Jena, Stuttgart. HAYWARD, P. NELSON-SMITH, T., SHIELDS, C. & M. KREMER, 2008: Der neue Kosmos Strandführer - 1500 Arten der Küsten Europas. Franckh-Kosmos Verlag. HEMPEL, G., HEMPEL, I. & S. SCHIEL, 2006: Faszination Meeresforschung – Ein ökologisches Lesebuch. Hausschild. HIGGINS, R.P. & H., THIEL, 1988: Introduction to the Study of Meiofauna. Smithsonian Institution Press,</p> |

Washington, D.C., London.

RUNDLE, S.D., ROBERTSON, A.L. & J.M. SCHMID-ARAYA, 2002: Freshwater Meiofauna: Biology and Ecology. Backhuys Publishers, Leiden.

SOMMER, U., 2005: Biologische Meereskunde. 2. Auflage, Springer Verlag, Berlin, Heidelberg.

TARDENT, P., 1993: Meeresbiologie, eine Einführung. 2. Auflage, Georg Thieme Verlag, Stuttgart, New York.

WESTHEIDE, W. & R., RIEGER, 2007/2004: Spezielle Zoologie. Band I, II. Gustav Fischer Verlag, Stuttgart, Jena.

The literature listed above is available in the university library. More reading will be recommended in the course of the lecture.

Literature inquiry:

web of science: [externhttp://www.bis.uni-oldenburg.de](http://www.bis.uni-oldenburg.de) - Datenbanken(DBIS) - Biologie - TOP-Datenbanken z.

B. ASFA, Science Citation Index, Zoological Record

<http://www.biodiversitylibrary.org/bibliography/14107>

[externhttp://scholar.google.de/](http://scholar.google.de/)

[externhttp://www.vifabio.de](http://www.vifabio.de)

Open access journals: [externhttp://www.doaj.org/](http://www.doaj.org/) - [externhttp://www.plosone.org](http://www.plosone.org)

| | | | |
|--|-----------------------------------|---------------------|--------------|
| Links | http:// | | |
| Language of instruction | German | | |
| Duration (semesters) | 1 Semester | | |
| Module frequency | jährlich | | |
| Module capacity | unlimited | | |
| Modullevel | AS (Akzentsetzung / Accentuation) | | |
| Modulart | Wahlpflicht / Elective | | |
| Lern-/Lehrform / Type of program | | | |
| Vorkenntnisse / Previous knowledge | | | |
| Examination | Time of examination | Type of examination | |
| Final exam of module | During lectures | 1 Portfolio | |
| PLEASE NOTE: Additional conditions regarding attendance and ungraded activities as determined by the persons responsible for the module will apply. | | | |
| Course type | Comment | SWS | Frequency |
| Lecture | | 2.00 | 28 h |
| Exercises | | 9.00 | 126 h |
| Seminar | | 2.00 | 28 h |
| Total time of attendance for the module | | | 182 h |

bio375 - Flora - Advanced Concepts

| | | | | |
|--|--|------|---------------------|---------------------|
| Module label | Flora - Advanced Concepts | | | |
| Module code | bio375 | | | |
| Credit points | 6.0 KP | | | |
| Workload | 180 h | | | |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Bachelor's Programme Mathematics (Bachelor) > Nebenfachmodule • Dual-Subject Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Master of Education Programme (Gymnasium) Biology (Master of Education) > Mastermodule | | | |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Dirk Carl Albach <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Dirk Carl Albach ◦ Klaus Bernhard von Hagen ◦ Maria Will <p>Module counseling</p> <ul style="list-style-type: none"> ◦ Klaus Bernhard von Hagen ◦ Maria Will | | | |
| Entry requirements | bio256 Flora and Fauna | | | |
| Skills to be acquired in this module | <p>+ biological knowledge + knowledge of biological working methods + deepened expertise in biological specialist field + independent learning and (research-based) working + data presentation and evidence-based discussion (written and spoken) + (scientific) communication skills + knowledge of safety and environmental issues</p> <p>The module is intended to give students in-depth knowledge on plant determination and the diversity of plants. Students shall increase their knowledge on species and learn and improve their abilities in plant determination and plant conservation. Subjects and methods relevant for nature conservation are emphasized. Along with these, students shall improve their systemic thinking with relation to nature in northwestern Germany and its flora. Students learn about plants and how to group them according to their phylogeny and evolutionary adaptations, so they can pass this knowledge on to others. Competence in assessment is conveyed in the areas of diversity and nature conservation to sensitize students for a respectful treatment of nature and passing on this ability to others. Finally, we will discuss sustainable use of plants and habitats and their restoration.</p> | | | |
| Module contents | <p>The module comprises a lecture in the Botanical Garden, where plants will be observed and investigated. This includes algae, bryophytes, ferns, gymnosperms and various families of angiosperms. The seminar is intended to let students study in-depth additional plant families with their typical characters.</p> | | | |
| Reader's advisory | Rothmaler - Exkursionsflora von Deutschland. Gefäßpflanzen: Grundband | | | |
| Links | | | | |
| Language of instruction | German | | | |
| Duration (semesters) | 1 Semester | | | |
| Module frequency | The module will be offered every other year | | | |
| Module capacity | 12 | | | |
| Modullevel | AS (Akzentsetzung / Accentuation) | | | |
| Modulart | Wahlpflicht / Elective | | | |
| Lern-/Lehrform / Type of program | Vorlesung, Seminar | | | |
| Vorkenntnisse / Previous knowledge | | | | |
| Examination | Time of examination | | Type of examination | |
| Final exam of module | portfolio | | | |
| Course type | Comment | SWS | Frequency | Workload attendance |
| Lecture | | 2.00 | SuSe | 28 h |
| Seminar | | 2.00 | SuSe | 28 h |
| Total time of attendance for the module | | | | 56 h |

bio376 - Flora - Advanced Methods

| | | |
|---|---|---------------------|
| Module label | Flora - Advanced Methods | |
| Module code | bio376 | |
| Credit points | 6.0 KP | |
| Workload | 180 h | |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Bachelor's Programme Mathematics (Bachelor) > Nebenfachmodule • Dual-Subject Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule | |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Dirk Carl Albach <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Dirk Carl Albach ◦ Klaus Bernhard von Hagen ◦ Maria Will <p>Module counseling</p> <ul style="list-style-type: none"> ◦ Klaus Bernhard von Hagen ◦ Maria Will | |
| Entry requirements | bio256 Flora and Fauna bio375 Flora - Advanced concepts | |
| Skills to be acquired in this module | <ul style="list-style-type: none"> + biological knowledge + knowledge of biological working methods + deepened expertise in biological specialist field + independent learning and (research-based) working + data presentation and evidence-based discussion (written and spoken) + (scientific) communication skills + knowledge of safety and environmental issues <p>The module is intended to give students in-depth knowledge on plant determination and the diversity of plants. Students shall increase their knowledge on species and learn and improve their abilities in plant determination and plant conservation. Subjects and methods relevant for nature conservation are emphasized. Along with these, students shall improve their systemic thinking with relation to nature in northwestern Germany and its flora. Students learn about plants and how to group them according to their phylogeny and evolutionary adaptations, so they can pass this knowledge on to others. Competence in assessment is conveyed in the areas of diversity and nature conservation to sensitize students for a respectful treatment of nature and passing on this ability to others. Finally, we will discuss sustainable use of plants and habitats and their restoration.</p> | |
| Module contents | The exercises will be used to apply the abilities to plant species in the vicinity of Oldenburg and to practice methods in mapping and surveying plant species. | |
| Reader's advisory | Rothmaler - Exkursionsflora von Deutschland. Gefäßpflanzen: Grundband | |
| Links | | |
| Language of instruction | German | |
| Duration (semesters) | 1 Semester | |
| Module frequency | The module will be offered every other year | |
| Module capacity | 12 | |
| Modullevel | AS (Akzentsetzung / Accentuation) | |
| Modulart | Wahlpflicht / Elective | |
| Lern-/Lehrform / Type of program | Übung | |
| Vorkenntnisse / Previous knowledge | | |
| Examination | Time of examination | Type of examination |
| Final exam of module | portfolio | |
| Course type | Exercises | |
| SWS | 4.00 | |
| Frequency | SuSe | |
| Workload attendance | 56 h | |

bio377 - Flora - Advanced Methods not just for schools

| | | |
|---|--|---------------------|
| Module label | Flora - Advanced Methods not just for schools | |
| Module code | bio377 | |
| Credit points | 9.0 KP | |
| Workload | 270 h | |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Bachelor's Programme Mathematics (Bachelor) > Nebenfachmodule • Dual-Subject Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Master of Education Programme (Gymnasium) Biology (Master of Education) > Mastermodule | |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Dirk Carl Albach <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Dirk Carl Albach ◦ Klaus Bernhard von Hagen ◦ Maria Will <p>Module counseling</p> <ul style="list-style-type: none"> ◦ Klaus Bernhard von Hagen ◦ Maria Will | |
| Entry requirements | bio375 Flora - Advanced Concepts bio256 Flora and Fauna | |
| Skills to be acquired in this module | <p>+ biological knowledge + knowledge of biological working methods + deepened expertise in biological specialist field + independent learning and (research-based) working + data presentation and evidence-based discussion (written and spoken) + (scientific) communication skills + knowledge of safety and environmental issues</p> <p>The module is intended to give students in-depth knowledge on plant determination and the diversity of plants. Students shall increase their knowledge on species and learn and improve their abilities in plant determination and plant conservation. Subjects and methods relevant for nature conservation are emphasized. Along with these, students shall improve their systemic thinking with relation to nature in northwestern Germany and its flora. Students learn about plants and how to group them according to their phylogeny and evolutionary adaptations, so they can pass this knowledge on to others. Competence in assessment is conveyed in the areas of diversity and nature conservation to sensitize students for a respectful treatment of nature and passing on this ability to others. Finally, we will discuss sustainable use of plants and habitats and their restoration.</p> | |
| Module contents | The exercises will be used to apply the abilities to identify plant species in the vicinity of Oldenburg and to practice methods in mapping and surveying plant species. Investigations applicable to school lessons will be presented and especially thoroughly discussed. | |
| Reader's advisory | Rothmaler - Exkursionsflora von Deutschland. Gefäßpflanzen: Grundband | |
| Links | | |
| Language of instruction | German | |
| Duration (semesters) | 1 Semester | |
| Module frequency | The module will be offered every other year | |
| Module capacity | 12 | |
| Modullevel | AS (Akzentsetzung / Accentuation) | |
| Modulart | Wahlpflicht / Elective | |
| Lern-/Lehrform / Type of program | Übung | |
| Vorkenntnisse / Previous knowledge | | |
| Examination | Time of examination | Type of examination |
| Final exam of module | | portfolio |
| Course type | Exercises | |
| SWS | 6.00 | |
| Frequency | SuSe | |
| Workload attendance | 84 h | |

bio385 - Specific Microbiology

| | | | | |
|--|--|------------|------------------------------|----------------------------|
| Module label | Specific Microbiology | | | |
| Module code | bio385 | | | |
| Credit points | 12.0 KP | | | |
| Workload | 360 h | | | |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Dual-Subject Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Master of Education Programme (Gymnasium) Biology (Master of Education) > Mastermodule | | | |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Ralf Andreas Rabus <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Ralf Andreas Rabus ◦ Daniel Wünsch | | | |
| Entry requirements | bio233 Basics in microbiology and genetics bio265 general microbiology | | | |
| Skills to be acquired in this module | THEORIE: verschiedene Kultivierungsstrategien (batch, fed-batch, kontinuierlich) und physiologische Interpretation von Meßparametern (Wachstumsraten, Respirationsraten, Ertrag) PRAXIS: apparatives Verständnis von und praktischer Umgang mit Bioreaktoren inkl. Sensorsystemen | | | |
| Module contents | Grundlagen der Prozess-kontrollierten Kultivierung in Bioreaktoren TEIL A: Umgang mit Bioreaktoren inkl. Analyse und Regelung von Prozess-Parametern TEIL B: Kultivierung mariner Bakterien unter definierten Bedingungen im Bioreaktor, Bilanzierung von Stoffwechselaktivitäten | | | |
| Reader's advisory | Schmauder HP (1994) Methoden der Biotechnologie, Kapitel 3.2.2. Gustav Fischer Verlag Jena Chmiel H, Briechele S (1991) Bioprozesstechnik. Gustav Fischer Verlag Stuttgart | | | |
| Links | www.icbm.de/ammb | | | |
| Language of instruction | German | | | |
| Duration (semesters) | 1 Semester | | | |
| Module frequency | jährlich | | | |
| Module capacity | 8 | | | |
| Modullevel | AS (Akzentsetzung / Accentuation) | | | |
| Modulart | Wahlpflicht / Elective | | | |
| Lern-/Lehrform / Type of program | Vorlesung, Seminar, Praktikum | | | |
| Vorkenntnisse / Previous knowledge | Chemie | | | |
| Examination | Time of examination | | Type of examination | |
| Final exam of module | | | exam (50%) protocol (50%) | |
| Course type | Comment | SWS | Frequency | Workload attendance |
| Lecture | | 2.00 | WiSe | 28 h |
| Seminar | | 2.00 | WiSe | 28 h |
| Practical | | 6.00 | WiSe | 84 h |
| Total time of attendance for the module | | | | 140 h |

bio395 - Plant Molecular Biology and Genetics I

| | | | | |
|---|---|---------------------|-----------|---------------------|
| Module label | Plant Molecular Biology and Genetics I | | | |
| Module code | bio395 | | | |
| Credit points | 6.0 KP | | | |
| Workload | 180 h | | | |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Bachelor's Programme Mathematics (Bachelor) > Nebenfachmodule • Dual-Subject Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Master of Education Programme (Gymnasium) Biology (Master of Education) > Mastermodule | | | |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Sascha Laubinger <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Sascha Laubinger ◦ Udo Gowik <p>Module counseling</p> <ul style="list-style-type: none"> ◦ Udo Gowik | | | |
| Entry requirements | | | | |
| Skills to be acquired in this module | <p>++ biological knowledge ++ knowledge of biological working methods + biologically relevant knowledge in the natural sciences and mathematics + statistics & scientific programming ++ interdisciplinary knowledge & thinking ++ abstract, logical, analytical thinking ++ deepened expertise in biological specialist field ++ independent learning and (research-based) working ++ data presentation and evidence-based discussion (written and spoken) ++ teamwork ++ (scientific) communication skills ++ project and time management + knowledge of safety and environmental issues</p> <p>The module serves the in-depth study of state-of-the-art techniques and problems in the field of molecular plant biology and plant genetics. Specialist competencies: basic knowledge in plant genetics, plant developmental genetics, plant/environment interactions and molecular basis of gene regulation General competencies: Presentation of scientific papers, presentation techniques, teamwork, problem solving competencies</p> | | | |
| Module contents | <p>Part of this module is a lecture that addresses several topics of modern plant molecular biology. The main focus is on plant developmental genetics, plant/environment interactions and the underlying molecular mechanisms of gene regulation in plants. At the beginning of the module, the students will present diverse molecular biology techniques and the latest developments in the field in a "method and techniques" seminar. In a "literature" seminar, the students will present and discuss a recent publication on one of the above-mentioned topics.</p> | | | |
| Reader's advisory | Literature will be handed out at the beginning of the course. | | | |
| Links | | | | |
| Languages of instruction | German, English | | | |
| Duration (semesters) | 1 Semester | | | |
| Module frequency | jährlich | | | |
| Module capacity | 16 | | | |
| Reference text | This module is mandatory for "Plant molecular biology and genetics II" | | | |
| Modullevel | AS (Akzentsetzung / Accentuation) | | | |
| Modulart | Wahlpflicht / Elective | | | |
| Lern-/Lehrform / Type of program | Vorlesung, Seminar | | | |
| Vorkenntnisse / Previous knowledge | | | | |
| Examination | Time of examination | Type of examination | | |
| Final exam of module | Written examination (good seminar presentations improve the grade) | | | |
| Course type | Comment | SWS | Frequency | Workload attendance |
| Lecture | | 2.00 | WiSe | 28 h |

| Course type | Comment | SWS | Frequency | Workload attendance |
|--|---------|------|-----------|---------------------|
| Seminar | | 2.00 | WiSe | 28 h |
| Total time of attendance for the module | | | | 56 h |

bio396 - Plant Molecular Biology and Genetics II

| | | |
|---|---|---------------------|
| Module label | Plant Molecular Biology and Genetics II | |
| Module code | bio396 | |
| Credit points | 6.0 KP | |
| Workload | 180 h | |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Bachelor's Programme Mathematics (Bachelor) > Nebenfachmodule • Dual-Subject Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Master of Education Programme (Gymnasium) Biology (Master of Education) > Mastermodule | |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Sascha Laubinger <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Sascha Laubinger ◦ Udo Gowik <p>Module counseling</p> <ul style="list-style-type: none"> ◦ Udo Gowik | |
| Entry requirements | bio395 Plant molecular biology and genetics I | |
| Skills to be acquired in this module | <p>++ biological knowledge ++ knowledge of biological working methods + biologically relevant knowledge in the natural sciences and mathematics + statistics & scientific programming ++ interdisciplinary knowledge & thinking ++ abstract, logical, analytical thinking ++ deepened expertise in biological specialist field ++ independent learning and (research-based) working ++ data presentation and evidence-based discussion (written and spoken) ++ teamwork ++ (scientific) communication skills ++ project and time management + knowledge of safety and environmental issues</p> <p>The module serves the in-depth study of state-of-the-art techniques and problems in the field of molecular plant biology and plant genetics. Specialist competencies: Acquiring basic skill in plant molecular biology, genetics and plant biochemistry Methodological competencies: molecular biology techniques, conducted independently General competencies: Presentation of scientific results, presentation techniques, teamwork, problem solving competencies</p> | |
| Module contents | Part of this module is a lecture that addresses several topics of modern plant molecular biology. The main focus is on plant developmental genetics, plant/environment interactions and the underlying molecular mechanisms of gene regulation in plants. At the beginning of the module, the students will present diverse molecular biology techniques and the latest developments in the field in a "method and techniques" seminar. In a "literature" seminar, the students will present and discuss a recent publication on one of the above-mentioned topics. | |
| Reader's advisory | Literature will be handed out at the beginning of the course. | |
| Links | | |
| Languages of instruction | German, English | |
| Duration (semesters) | 1 Semester | |
| Module frequency | annually | |
| Module capacity | 16 | |
| Modullevel | AS (Akzentsetzung / Accentuation) | |
| Modulart | Wahlpflicht / Elective | |
| Lern-/Lehrform / Type of program | Übung | |
| Vorkenntnisse / Previous knowledge | | |
| Examination | Time of examination | Type of examination |
| Final exam of module | portfolio (presentation, protocols) | |
| Course type | Exercises | |
| SWS | 4.00 | |
| Frequency | WiSe | |

Workload attendance

56 h

bio405 - Introduction to Neurobiology I

| | | | | |
|--|---|------------|---------------------|----------------------------|
| Module label | Introduction to Neurobiology I | | | |
| Module code | bio405 | | | |
| Credit points | 12.0 KP | | | |
| Workload | 360 h | | | |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Bachelor's Programme Mathematics (Bachelor) > Nebenfachmodule • Dual-Subject Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Master of Education Programme (Gymnasium) Biology (Master of Education) > Mastermodule | | | |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Martin Greschner <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Martin Greschner ◦ Ulrike Janssen-Bienhold ◦ Georg Martin Klump <p>Module counseling</p> <ul style="list-style-type: none"> ◦ Karl-Wilhelm Koch ◦ Ulrike Janssen-Bienhold ◦ Georg Martin Klump | | | |
| Entry requirements | | | | |
| Skills to be acquired in this module | <p>++ deepened biological expertise ++ deepened knowledge of biological working methods + scientific/mathematical basic knowledge relevant for biology + critical and analytical thinking ++ data presentation and discussion in German (written and spoken) + teamwork</p> | | | |
| Module contents | <p>The lecture covers the molecular and cellular basis of neurobiology, the electrical properties of nerve cells, the organization and development of the nervous system and the function of the motor system. In the seminar, topics related to the lectures of the week are covered in more depth. In the exercises, the theoretical knowledge from the lectures will be tested in small experiments.</p> | | | |
| Reader's advisory | Purves D. et al.: Neuroscience, Sinauer Associates, Sunderland USA, latest edition | | | |
| Links | | | | |
| Language of instruction | German | | | |
| Duration (semesters) | 1 Semester | | | |
| Module frequency | annually | | | |
| Module capacity | 30 | | | |
| Reference text | associated with the modules bio415 and bio416 Introduction to Neurobiology II in the winter semester | | | |
| Modullevel | AS (Akzentsetzung / Accentuation) | | | |
| Modulart | Wahlpflicht / Elective | | | |
| Lern-/Lehrform / Type of program | Vorlesung, Seminar, Übung | | | |
| Vorkenntnisse / Previous knowledge | Grundlagen der Physiologie/ Zellbiologie | | | |
| Examination | Time of examination | | Type of examination | |
| Final exam of module | end of semester | | exam and protocol | |
| Course type | Comment | SWS | Frequency | Workload attendance |
| Lecture | | 3.00 | SuSe | 42 h |
| Seminar | | 1.00 | SuSe | 14 h |
| Exercises | | 4.00 | SuSe | 56 h |
| Tutorial (optional) | | 0.00 | SuSe and WiSe | 0 h |
| Total time of attendance for the module | | | | 112 h |

bio415 - Introduction to Neurobiology II

| | | | | |
|--|--|---------------------|------------------|----------------------------|
| Module label | Introduction to Neurobiology II | | | |
| Module code | bio415 | | | |
| Credit points | 6.0 KP | | | |
| Workload | 180 h | | | |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Bachelor's Programme Mathematics (Bachelor) > Nebenfachmodule • Dual-Subject Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Master of Education Programme (Gymnasium) Biology (Master of Education) > Mastermodule | | | |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Georg Martin Klump <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Georg Martin Klump ◦ Christiane Margarete Thiel ◦ Christine Köppl ◦ Martin Greschner ◦ Jannis Hildebrandt <p>Module counseling</p> <ul style="list-style-type: none"> ◦ Christiane Margarete Thiel ◦ Christine Köppl ◦ Martin Greschner ◦ Jannis Hildebrandt | | | |
| Entry requirements | | | | |
| Skills to be acquired in this module | ++ deepened biological expertise ++ deepened knowledge of biological working methods + scientific/mathematical basic knowledge relevant for biology + critical and analytical thinking | | | |
| Module contents | The lecture covers the basics of systemic neuroscience with a focus on processing in sensory systems, the plasticity of the nervous system and the mechanisms underlying cognitive processing. In the seminar, topics related to the lectures of the week are covered in more depth. | | | |
| Reader's advisory | Purves D. et al.: Neuroscience, Sinauer Associates, Sunderland USA, latest edition | | | |
| Links | | | | |
| Language of instruction | German | | | |
| Duration (semesters) | 1 Semester | | | |
| Module frequency | | | | |
| Module capacity | 30 | | | |
| Modullevel | AS (Akzentsetzung / Accentuation) | | | |
| Modulart | Wahlpflicht / Elective | | | |
| Lern-/Lehrform / Type of program | Vorlesung, Seminar | | | |
| Vorkenntnisse / Previous knowledge | Grundlagen der Physiologie/ Wahrnehmung | | | |
| Examination | Time of examination | Type of examination | | |
| Final exam of module | end of semester | written exam | | |
| Course type | Comment | SWS | Frequency | Workload attendance |
| Lecture | | 3.00 | WiSe | 42 h |
| Seminar | | 1.00 | WiSe | 14 h |
| Total time of attendance for the module | | | | 56 h |

bio416 - Experiments in Neurobiology II

| | | |
|---|--|---|
| Module label | Experiments in Neurobiology II | |
| Module code | bio416 | |
| Credit points | 6.0 KP | |
| Workload | 180 h | |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Bachelor's Programme Mathematics (Bachelor) > Nebenfachmodule • Dual-Subject Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Master of Education Programme (Gymnasium) Biology (Master of Education) > Mastermodule | |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Georg Martin Klump <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Georg Martin Klump ◦ Christiane Margarete Thiel ◦ Ulrike Langemann <p>Module counseling</p> <ul style="list-style-type: none"> ◦ Christiane Margarete Thiel ◦ Ulrike Langemann | |
| Entry requirements | bio415 "Introduction to Neurobiology II" | |
| Skills to be acquired in this module | ++ deepened biological expertise ++ deepened knowledge of biological working methods ++ data analysis skills ++ data presentation and discussion in German and English (written and spoken) + teamwork + scientific/mathematical basic knowledge relevant for biology | |
| Module contents | The exercise immediately follows the module "Introduction to Neurobiology II". By experimenting with each other, the students deepen their knowledge in the fields of cognitive neuroscience and hearing science. The students analyze their own data (incl. statistics) and present these in a written report. | |
| Reader's advisory | Purves D. et al.: Neuroscience, Sinauer Associates, Sunderland USA, latest edition | |
| Links | | |
| Language of instruction | German | |
| Duration (semesters) | 1 Semester | |
| Module frequency | annually | |
| Module capacity | 30 | |
| Modullevel | AS (Akzentsetzung / Accentuation) | |
| Modulart | Wahlpflicht / Elective | |
| Lern-/Lehrform / Type of program | Übung | |
| Vorkenntnisse / Previous knowledge | Neurobiologie II | |
| Examination | Time of examination | Type of examination |
| Final exam of module | end of module | portfolio (data analysis, presentation) |
| Course type | Exercises | |
| SWS | 4.00 | |
| Frequency | WiSe | |
| Workload attendance | 56 h | |

bio420 - Biochemistry of the Cell

| | | | | |
|--|--|------------|---------------------|----------------------------|
| Module label | Biochemistry of the Cell | | | |
| Module code | bio420 | | | |
| Credit points | 6.0 KP | | | |
| Workload | 180 h | | | |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodul • Dual-Subject Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodul • Master of Education Programme (Gymnasium) Biology (Master of Education) > Mastermodule | | | |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Alexander Scholten <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Alexander Scholten | | | |
| Entry requirements | | | | |
| Skills to be acquired in this module | <p>++ biological knowledge + knowledge of biological working methods + biologically relevant knowledge in the natural sciences and mathematics + abstract, logical, analytical thinking + data presentation and evidence-based discussion (written and spoken) ++ (scientific) communication skills</p> | | | |
| Module contents | supramolecular organization in the cell, interactions of biomolecules, signalling fluxes | | | |
| Reader's advisory | Biochemie, Müller-Esterl Biochemie, Lubert Stryer Lehninger Prinzipien der Biochemie, David L. Nelson und Michael M. Cox Principles of Biochemistry, Horton et al. | | | |
| Links | | | | |
| Language of instruction | German | | | |
| Duration (semesters) | 1 Semester | | | |
| Module frequency | annually | | | |
| Module capacity | 20 | | | |
| Modullevel | AS (Akzentsetzung / Accentuation) | | | |
| Modulart | Wahlpflicht / Elective | | | |
| Lern-/Lehrform / Type of program | Vorlesung, Seminar, Übung | | | |
| Vorkenntnisse / Previous knowledge | Biochemie und Molekularbiologie | | | |
| Examination | Time of examination | | Type of examination | |
| Final exam of module | during the semester | | oral presentation | |
| Course type | Comment | SWS | Frequency | Workload attendance |
| Lecture | | 1.00 | WiSe | 14 h |
| Exercises | | 1.00 | WiSe | 14 h |
| Seminar | | 2.00 | WiSe | 28 h |
| Total time of attendance for the module | | | | 56 h |

bio430 - Analytical Biochemistry

| | | | | |
|--|--|------|---------------------------------|---------------------|
| Module label | Analytical Biochemistry | | | |
| Module code | bio430 | | | |
| Credit points | 6.0 KP | | | |
| Workload | 180 h | | | |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Dual-Subject Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Master of Education Programme (Gymnasium) Biology (Master of Education) > Mastermodule | | | |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Karl-Wilhelm Koch <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Alexander Scholten ◦ Karl-Wilhelm Koch <p>Module counseling</p> <ul style="list-style-type: none"> ◦ Alexander Scholten | | | |
| Entry requirements | | | | |
| Skills to be acquired in this module | <p>++ biological knowledge ++ knowledge of biological working methods + biologically relevant knowledge in the natural sciences and mathematics + abstract, logical, analytical thinking + deepened expertise in biological specialist field ++ data presentation and evidence-based discussion (written and spoken) + teamwork</p> <p>The students get a survey of current techniques in Biochemistry and learn some essential techniques such as column chromatography and enzyme kinetic measurements in practice. They understand the theoretical fundamentals of these techniques and assess experimentally collected data bases.</p> | | | |
| Module contents | Bioanalytical methods in theory and practice | | | |
| Reader's advisory | Bioanalytik, Lottspeich/Engels | | | |
| Links | | | | |
| Language of instruction | German | | | |
| Duration (semesters) | 1 Semester | | | |
| Module frequency | annually | | | |
| Module capacity | 20 | | | |
| Modullevel | AS (Akzentsetzung / Accentuation) | | | |
| Modulart | Wahlpflicht / Elective | | | |
| Lern-/Lehrform / Type of program | Vorlesung, Seminar, Übung | | | |
| Vorkenntnisse / Previous knowledge | Biochemie, Molekularbiologie | | | |
| Examination | Time of examination | | Type of examination | |
| Final exam of module | during semester | | oral presentation and protocoll | |
| Course type | Comment | SWS | Frequency | Workload attendance |
| Lecture | | 1.00 | SuSe | 14 h |
| Seminar | | 1.00 | SuSe | 14 h |
| Exercises | | 2.00 | SuSe | 28 h |
| Total time of attendance for the module | | | | 56 h |

bio440 - Microfauna, Mircoflora & Protista of limnic and marine habitats

| | |
|---|--|
| Module label | Microfauna, Mircoflora & Protista of limnic and marine habitats |
| Module code | bio440 |
| Credit points | 6.0 KP |
| Workload | 180 h |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Dual-Subject Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Master of Education Programme (Gymnasium) Biology (Master of Education) > Mastermodule |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Wilko Ahlrichs <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Wilko Ahlrichs ◦ Alexander Kieneke ◦ Mona Hoppenrath <p>Module counseling</p> <ul style="list-style-type: none"> ◦ Alexander Kieneke ◦ Mona Hoppenrath |
| Entry requirements | |
| Skills to be acquired in this module | <p>++ biological knowledge ++ knowledge of biological working methods ++ biologically relevant knowledge in the natural sciences and mathematics + statistics & scientific programming ++ interdisciplinary knowledge & thinking + abstract, logical, analytical thinking ++ deepened expertise in biological specialist field ++ independent learning and (research-based) working ++ data presentation and evidence-based discussion (written and spoken) + teamwork ++ (scientific) communication skills + project and time management</p> <p>The objectives of the module are the teaching and learning of methods in the field of taxonomy, systematics, morphology, ecology, and evolution. Competencies for finding, identifying, preparing, micro-copying, illustrating, describing, and publishing species are taught. It learns how a scientific collection is created and managed. Another goal is the teaching of basics of molecular systematics and barcoding. The focus is on taxa of the microfauna and protists of limnic and marine habitats. The goal is the knowledge of biotic and abiotic properties of aquatic habitats, their formation and biodiversity. The students should learn to hypothesize structural adaptations of organisms to aquatic habitats.</p> |
| Module contents | <p>We study microfauna and protists of limnic and marine habitats. Microfauna refers to microscopic animals. They live together with protists aquatic habitats in high diversity. Animals of the microfauna and protists usually belong to groups that developed early in evolution. The study of communities of these groups give a unique insight into the evolution of animals and protists. The microfauna and the protists are little studied compared to other groups of animals and offer great potential. But they must be examined under the optical microscope. This requires special techniques and knowledge. Fortunately, through digital techniques, the investigation and publications have been greatly simplified. We will make excursions to ponds, ponds, lakes, rivers, bogs, sea beaches, etc. It teaches where, when, and how to find species of microfauna and protists. The collected organisms are determined, prepared, microscoped, photographed, drawn, and digitally illustrated. Art descriptions are produced. Attention is paid to the correct application of nomenclature rules. We show how a scientific collection is built and managed. For this purpose, basic knowledge in SQL database technology is taught. Dichotomous, synoptic, and digital identification keys are presented and developed. In addition to the classical morphological methods, it will be shown how species for molecular barcoding and phylogenetic analyzes are investigated. The students will create art portraits. The results are communicated in the form of posters, short lectures, and scientific publications.</p> |
| Reader's advisory | Will be announced in the course. |
| Links | |
| Language of instruction | German |
| Duration (semesters) | 1 Semester |
| Module frequency | irregular |
| Module capacity | 12 (For more applicants than places, a motivation letter decides on the admission.) |

| | | | | |
|--|-----------------------------------|------|---------------------|---------------------|
| Modullevel | AS (Akzentsetzung / Accentuation) | | | |
| Modulart | Wahlpflicht / Elective | | | |
| Lern-/Lehrform / Type of program | Seminar, Übung, Exkursion | | | |
| Vorkenntnisse / Previous knowledge | Lichtmikroskopie | | | |
| Examination | Time of examination | | Type of examination | |
| Final exam of module | | | Portfolio | |
| Course type | Comment | SWS | Frequency | Workload attendance |
| Study trip | | 1.00 | SuSe | 14 h |
| Seminar | | 1.00 | SuSe | 14 h |
| Exercises | | 2.00 | SuSe | 28 h |
| Total time of attendance for the module | | | | 56 h |

bio450 - Posters, Pictures, Presentations and Papers

| | | |
|---|--|---------------------|
| Module label | Posters, Pictures, Presentations and Papers | |
| Module code | bio450 | |
| Credit points | 9.0 KP | |
| Workload | 270 h | |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Dual-Subject Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Master of Education Programme (Gymnasium) Biology (Master of Education) > Mastermodule | |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Olaf Bininda-Emonds <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Olaf Bininda-Emonds ◦ Wilko Ahlrichs <p>Module counseling</p> <ul style="list-style-type: none"> ◦ Wilko Ahlrichs | |
| Entry requirements | | |
| Skills to be acquired in this module | <p>+ interdisciplinary knowledge & thinking + abstract, logical, analytical thinking + deepened expertise in biological specialist field ++ independent learning and (research-based) working ++ data presentation and evidence-based discussion (written and spoken) ++ (scientific) communication skills + project and time management</p> <p>Practical experience with four forms of scientific presentation: papers, presentations, scientific drawings, and posters. The students will learn / gain: 1) the logical and structural form of a scientific paper (or protocol or thesis) so as to communicate their results more effectively; 2) the distillation of the key information out of a project and its focused presentation in a lecture or poster; 3) experience with constructive criticism in a group setting as well as the critical assessment of scientific studies; 4) experience with scientific English; and 5) the art of scientific drawing, including the making of high-quality photo montages for papers or posters through microphotography and digital editing.</p> | |
| Module contents | <p>Theoretical part: General tips regarding the logical and structural form of a scientific paper, presentation, or posters, including how to avoid making the most common mis-takes.</p> <p>Practical part: Critical analysis of selected papers from the (evolutionary biological) literature. Writing of a scientific paper using pre-given results. Construction and presentation of a lecture and poster in front of the group based on a recent paper from the literature. Through the feedback obtained in this process, improvements will be made in both cases. Microscopic photography of selected zoological specimens that will then be transferred to / drawn on transparent paper before being rescanned for digital editing. High-quality photo montages of both the photos themselves and the drawings derived from them will be obtained through diverse software (e.g., Adobe Illustrator or InDesign).</p> | |
| Reader's advisory | None. The relevant scientific literature will be distributed during the course. | |
| Links | | |
| Languages of instruction | German, English | |
| Duration (semesters) | 1 Semester | |
| Module frequency | annually | |
| Module capacity | 10 (Letter of motivation) | |
| Modullevel | AS (Akzentsetzung / Accentuation) | |
| Modulart | Wahlpflicht / Elective | |
| Lern-/Lehrform / Type of program | Übung | |
| Vorkenntnisse / Previous knowledge | Erfahrungen in der Anwendung von Excel oder ähnlichen Software-Programmen mit Graph-Fähigkeiten, von Adobe Photoshop, und von PowerPoint, Keynote oder ähnlichen Software-Programmen | |
| Examination | Time of examination | Type of examination |
| Final exam of module | | Portfolio (100%) |
| Course type | Exercises | |

| | |
|----------------------------|------|
| SWS | 6.00 |
| Frequency | SuSe |
| Workload attendance | 84 h |

bio460 - Diversity of marine Invertebrates

| | |
|---|--|
| Module label | Diversity of marine Invertebrates |
| Module code | bio460 |
| Credit points | 6.0 KP |
| Workload | 180 h |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Dual-Subject Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Master of Education Programme (Gymnasium) Biology (Master of Education) > Mastermodule |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Thomas Glatzel <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Thomas Glatzel |
| Entry requirements | |
| Skills to be acquired in this module | <p>++ biological knowledge + knowledge of biological working methods + interdisciplinary knowledge & thinking ++ deepened expertise in biological specialist field ++ independent learning and (research-based) working ++ data presentation and evidence-based discussion (written and spoken) + teamwork ++ (scientific) communication skills ++ project and time management + knowledge of safety and environmental issues</p> <p>By actively participating in this module the students acquire qualifications in the fields stated below:</p> <ul style="list-style-type: none"> -Survey of recent subjects concerning the biology and morphology of aquatic organisms -Extended knowledge of how morphological characteristics have developed -Technical skills in preparing and documenting morphological structures -Knowledge of organizational principles of these structures |
| Module contents | <p>The module serves an extended examination of selected aquatic animals from a function morphological point of view. Living and fixed animals are investigated and histological preparations are analysed. Thus, the morphology, anatomy, and histology are studied in detail. The biology and ecology of these animals are also considered, which enables the organisms to be studied very intensively and provides an illustrative basis for theoretical discussions.</p> |
| Reader's advisory | <p>AX, P., 1995: Das System der Metazoa. I, II, III. Ein Lehrbuch der phylogenetischen Systematik. Gustav Fischer Verlag, Stuttgart, Jena. Textbook with somehow different ideas! Very well illustrated! Illustrations are suitable for presentations!</p> <p>GRUNER, H.-E., 1993: „Der Kaestner“, A., Lehrbuch der speziellen Zoologie. All volumes, Gustav Fischer/Spektrum Akademischer Verlag, Jena, Stuttgart. Many interesting details are found only in these volumes!</p> <p>GRÜTER, W., 2001: Leben im Meer – Vielfalt und Zusammenhänge. Dr. Friedrich Pfeil Verlag, München. This book arouses your curiosity about the underwater world.</p> <p>HAYWARD, P. NELSON-SMITH, T., SHIELDS, C. & M. KREMER, 2008: Der neue Kosmos Strandführer - 1500 Arten der Küsten Europas. Franckh-Kosmos Verlag. This coastal guide provides excellent and clearly arranged colour tables for individual groups.</p> <p>HOFRICHTER, R., 2002: Das Mittelmeer, Fauna-Flora-Ökologie. Band I, II, Spektrum Akademischer Verlag, Heidenberg, Berlin. Numerous details on individual groups in the second part.</p> <p>WESTHEIDE, W. & R., RIEGER, 2013: Spezielle Zoologie. Band I, II. Gustav Fischer Verlag, Stuttgart, Jena. The textbook absolute! My explicit recommendation!</p> <p>The literature listed above is available in the university library in Wechloy. Further reading will be recommended in the course of the lecture.</p> <p>Literature inquiry: web of science: http://rzblx10.uni-regensburg.de/dbinfo/dbliste.php?bib_id=ubol&colors=7&ocolors=40&lett=f&gebiete=5 – Data banks (DBIS) - Biology - TOPData banks e.g. ASFA, Science Citation Index, Zoological Record http://www.biodiversitylibrary.org/bibliography/14107 http://scholar.google.de/ http://www.vifabio.de Open access journals: http://www.doaj.org/ - www.plosone.org</p> |
| Links | |
| Language of instruction | German |
| Duration (semesters) | 1 Semester |

| | |
|---|-----------------------------------|
| Module frequency | annually |
| Module capacity | 15 |
| Modullevel | AS (Akzentsetzung / Accentuation) |
| Modulart | Wahlpflicht / Elective |
| Lern-/Lehrform / Type of program | Seminar, Übung |

Vorkenntnisse / Previous knowledge

| | | |
|-----------------------------|---------------------|---------------------|
| Examination | Time of examination | Type of examination |
| Final exam of module | During the lecture | portfolio |

PLEASE NOTE:
Additional conditions regarding attendance
and ungraded activities as determined by
the persons responsible for the module will
apply.

| Course type | Comment | SWS | Frequency | Workload attendance |
|--|---------|------|-----------|---------------------|
| Exercises | | 3.00 | WiSe | 42 h |
| Seminar | | 1.00 | WiSe | 14 h |
| Total time of attendance for the module | | | | 56 h |

bio470 - Marine Biology Field Trip

| | | | | |
|--|---|------------|---------------------|----------------------------|
| Module label | Marine Biology Field Trip | | | |
| Module code | bio470 | | | |
| Credit points | 6.0 KP | | | |
| Workload | 180 h | | | |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Dual-Subject Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Master of Education Programme (Gymnasium) Biology (Master of Education) > Mastermodule | | | |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Wilko Ahlrichs <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Wilko Ahlrichs ◦ Alexander Kieneke <p>Module counseling</p> <ul style="list-style-type: none"> ◦ Alexander Kieneke | | | |
| Entry requirements | Motivationsschreiben bei mehr Teilnehmern als Plätzen. | | | |
| Skills to be acquired in this module | <p>++ biological knowledge ++ knowledge of biological working methods ++ biologically relevant knowledge in the natural sciences and mathematics + statistics & scientific programming + interdisciplinary knowledge & thinking + abstract, logical, analytical thinking ++ deepened expertise in biological specialist field ++ independent learning and (research-based) working ++ data presentation and evidence-based discussion (written and spoken) + teamwork ++ (scientific) communication skills + project and time management</p> <p>On completion of this modul students will: have a basic knowledge of the diversity of marine life; un-derstand the fundamental physiochemical and physiological processes underlying the productivity of marine environments; understand the ecological dynamics of marine ecosystems; appreciate the role of humans in disturbing and exploiting marine ecosystems; have developed a critical, analytical ap-proach to scientific research; have developed skills in writing scientific reports and in oral communica-tion of scientific information.</p> | | | |
| Module contents | Microscopy of marine fauna and flora of the wadden sea; Students are required plan and carry out a research project that exposes them to some of the challenges and problems encountered by field bi-ologists - and some of the techniques that are used to solve these problems. Students have to present a scientific poster and a short oral presentation. | | | |
| Reader's advisory | Will be announced in the course. | | | |
| Links | | | | |
| Language of instruction | German | | | |
| Duration (semesters) | 1 Semester | | | |
| Module frequency | annually | | | |
| Module capacity | 14 (For more applicants than places, a letter of moti-vation decides on the admission.) | | | |
| Modullevel | AS (Akzentsetzung / Accentuation) | | | |
| Modulart | Wahlpflicht / Elective | | | |
| Lern-/Lehrform / Type of program | Seminar, Übung, Exkursion | | | |
| Vorkenntnisse / Previous knowledge | Kenntnisse der Großgruppen der Tiere, der Pflanzen und der Protisten | | | |
| Examination | Time of examination | | Type of examination | |
| Final exam of module | Modulende | | portfolio | |
| Course type | Comment | SWS | Frequency | Workload attendance |
| Seminar | | 2.00 | SuSe | 28 h |
| Exercises | | 2.00 | SuSe | 28 h |
| Study trip | | 2.00 | SuSe | 28 h |
| Total time of attendance for the module | | | | 84 h |

bio480 - Functional Morphology of Plants

| | | | | |
|--|---|------------|---------------------|----------------------------|
| Module label | Functional Morphology of Plants | | | |
| Module code | bio480 | | | |
| Credit points | 6.0 KP | | | |
| Workload | 180 h | | | |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Dual-Subject Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Master of Education Programme (Gymnasium) Biology (Master of Education) > Mastermodule | | | |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Gerhard Wolfgang Zotz <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Gerhard Wolfgang Zotz ◦ Helena Einzmann <p>Module counseling</p> <ul style="list-style-type: none"> ◦ Helena Einzmann | | | |
| Entry requirements | | | | |
| Skills to be acquired in this module | <p>++ biological knowledge + knowledge of biological working methods + biologically relevant knowledge in the natural sciences and mathematics + interdisciplinary knowledge & thinking + abstract, logical, analytical thinking ++ deepened expertise in biological specialist field + independent learning and (research-based) working</p> <p>Students acquire knowledge in macroscopic and microscopic morphology of plants, always putting form in the context of function Students understand the concepts of allometry and scaling Students put this knowledge in the context of theoretical concepts of ecology and evolution Students learn experimental techniques in diverse topics, e.g. biomechanics or water relations</p> | | | |
| Module contents | <p>V: Functional Morphology of Plants (1 SWS) E: Mikroskopie, biomechanical Experiments, Form/Function Experiments regarding water uptake, storage and loss (2 SWS) S new studies in the field of functional morphology (1 SWS)</p> | | | |
| Reader's advisory | <p>Kadereit JW, et al (2014) Strasburger Lehrbuch der Botanik. 37. Aufl. Spektrum Akademischer Verlag Eschrich, W. (1995) Funktionelle Pflanzenanatomie. Springer</p> | | | |
| Links | | | | |
| Language of instruction | German | | | |
| Duration (semesters) | 1 Semester | | | |
| Module frequency | annually | | | |
| Module capacity | 10 | | | |
| Modullevel | AS (Akzentsetzung / Accentuation) | | | |
| Modulart | Wahlpflicht / Elective | | | |
| Lern-/Lehrform / Type of program | Vorlesung, Seminar, Übung | | | |
| Vorkenntnisse / Previous knowledge | Ökologie, Flora | | | |
| Examination | Time of examination | | Type of examination | |
| Final exam of module | 1 Portfolio (oral presentation and 1 report) | | | |
| Course type | Comment | SWS | Frequency | Workload attendance |
| Lecture | | 1.00 | SuSe | 14 h |
| Seminar | | 1.00 | SuSe | 14 h |
| Exercises | | 2.00 | SuSe | 28 h |
| Total time of attendance for the module | | | | 56 h |

bio320 - Pollination and Dispersal Biology

| | | | | |
|--|--|--|-----------|---------------------|
| Module label | Pollination and Dispersal Biology | | | |
| Module code | bio320 | | | |
| Credit points | 15.0 KP | | | |
| Workload | 450 h | | | |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Dual-Subject Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Master of Education Programme (Gymnasium) Biology (Master of Education) > Mastermodule | | | |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Dirk Carl Albach <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Dirk Carl Albach ◦ Klaus Bernhard von Hagen <p>Module counseling</p> <ul style="list-style-type: none"> ◦ Klaus Bernhard von Hagen | | | |
| Entry requirements | | | | |
| Skills to be acquired in this module | <ul style="list-style-type: none"> + biological knowledge + knowledge of biological working methods + abstract, logical, analytical thinking + deepened expertise in biological specialist field + independent learning and (research-based) working + data presentation and evidence-based discussion (written and spoken) + teamwork + (scientific) communication skills + project and time management + knowledge of safety and environmental issues <p>Extended knowledge of biodiversity and evolution of plants focusing on reproduction, dispersal, germination and establishment of plants</p> | | | |
| Module contents | <p>L: Pollination, dispersal, germination of plants, plant breeding S: Pollination and dispersal biology of plants in a systematic context LC: Pollination, fertilisation, dispersal and germination biological experiments in regard of adaptation to environmental factors</p> | | | |
| Reader's advisory | <p>The course does not follow a special textbook. The following German literature is recommended to students interested in the course: Dieter Heß – Die Blüte, Eugen Ulmer Verlag as well as Leins & Erbar -Blüte und Frucht, Schweizerbart'sche Verlagsbuchhandlung.</p> | | | |
| Links | http:// | | | |
| Language of instruction | German | | | |
| Duration (semesters) | 1 Semester | | | |
| Module frequency | jährlich | | | |
| Module capacity | unlimited | | | |
| Modullevel | AS (Akzentsetzung / Accentuation) | | | |
| Modulart | Wahlpflicht / Elective | | | |
| Lern-/Lehrform / Type of program | | | | |
| Vorkenntnisse / Previous knowledge | | | | |
| Examination | Time of examination | Type of examination | | |
| Final exam of module | Four weeks after the end of the exercises at the latest. | 1 Portfolio | | |
| | | PLEASE NOTE: Additional conditions regarding attendance and ungraded activities as determined by the persons responsible for the module will apply. | | |
| Course type | Comment | SWS | Frequency | Workload attendance |
| Lecture | | 2.00 | | 28 h |
| Seminar | | 1.00 | | 14 h |
| Practical | | 5.00 | | 70 h |
| Total time of attendance for the module | | | | 112 h |

bio350 - Organismic Microanatomy

| | | | | |
|--|--|------------|---|----------------------------|
| Module label | Organismic Microanatomy | | | |
| Module code | bio350 | | | |
| Credit points | 15.0 KP | | | |
| Workload | 450 h | | | |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Dual-Subject Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Master of Education Programme (Gymnasium) Biology (Master of Education) > Mastermodule | | | |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Wilko Ahlrichs <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Wilko Ahlrichs ◦ Mona Hoppenrath ◦ Alexander Kieneke <p>Module counseling</p> <ul style="list-style-type: none"> ◦ Mona Hoppenrath ◦ Alexander Kieneke | | | |
| Entry requirements | | | | |
| Skills to be acquired in this module | <ul style="list-style-type: none"> ++ biological knowledge ++ knowledge of biological working methods ++ biologically relevant knowledge in the natural sciences and mathematics + interdisciplinary knowledge & thinking ++ abstract, logical, analytical thinking ++ deepened expertise in biological specialist field ++ independent learning and (research-based) working ++ data presentation and evidence-based discussion (written and spoken) + teamwork ++ (scientific) communication skills + project and time management + knowledge of safety and environmental issues | | | |
| Module contents | Zell und Gewebelehre der Tiere und Protisten; Anpassungsleistungen von Organismen unterschiedlicher Lebensräume; Vorstellung traditioneller und aktueller Hypothesen zur Phylogenie und Evolution der Tiere; | | | |
| Reader's advisory | Wird zur Beginn der Veranstaltungen bekannt gegeben. | | | |
| Links | | | | |
| Language of instruction | German | | | |
| Duration (semesters) | 1 Semester | | | |
| Module frequency | jährlich | | | |
| Module capacity | unlimited | | | |
| Modullevel | AS (Akzentsetzung / Accentuation) | | | |
| Modulart | Wahlpflicht / Elective | | | |
| Lern-/Lehrform / Type of program | | | | |
| Vorkenntnisse / Previous knowledge | | | | |
| Examination | Time of examination | | Type of examination | |
| Final exam of module | Modulende | | Bachelor: 1 Portfolio Master of Education: 1 oral exam | |
| Course type | Comment | SWS | Frequency | Workload attendance |
| Lecture | | 3.00 | | 42 h |
| Exercises | | 5.00 | | 70 h |
| Study trip | | 1.00 | | 14 h |
| Total time of attendance for the module | | | | 126 h |

bio370 - Flora Advanced Plant Biodiversity

| | | | | |
|---|---|--|-----------|---------------------|
| Module label | Flora Advanced Plant Biodiversity | | | |
| Module code | bio370 | | | |
| Credit points | 15.0 KP | | | |
| Workload | 450 h | | | |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Dual-Subject Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Master of Education Programme (Gymnasium) Biology (Master of Education) > Mastermodule | | | |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Dirk Carl Albach <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Dirk Carl Albach ◦ Klaus Bernhard von Hagen <p>Module counseling</p> <ul style="list-style-type: none"> ◦ Klaus Bernhard von Hagen | | | |
| Entry requirements | passed module Flora/Fauna | | | |
| Skills to be acquired in this module | <p>+ biological knowledge + knowledge of biological working methods + deepened expertise in biological specialist field + independent learning and (research-based) working + data presentation and evidence-based discussion (written and spoken) + (scientific) communication skills + knowledge of safety and environmental issues</p> <p>The module is intended to give students in-depth knowledge on plant determination and the diversity of plants. Students shall increase their knowledge on species and learn and improve their abilities in plant determination and plant conservation.</p> | | | |
| Module contents | <p>The module comprises a lecture in the Botanical Garden, where plants will be observed and investigated. This includes algae, bryophytes, ferns, gymnosperms and various families of angiosperms. The seminar is intended to let students study in-depth additional plant families with their typical characters. The exercises will be used to apply the abilities to plant species in the vicinity of Oldenburg and to practice methods in mapping and surveying plant species.</p> | | | |
| Reader's advisory | Rothmaler - Exkursionsflora von Deutschland. Gefäßpflanzen: Grundband | | | |
| Links | | | | |
| Language of instruction | German | | | |
| Duration (semesters) | 1 Semester | | | |
| Module frequency | im 2-Jahres-Zyklus | | | |
| Module capacity | unlimited | | | |
| Reference text | The module will be offered biennially. | | | |
| Modullevel | AS (Akzentsetzung / Accentuation) | | | |
| Modulart | Wahlpflicht / Elective | | | |
| Lern-/Lehrform / Type of program | | | | |
| Vorkenntnisse / Previous knowledge | | | | |
| Examination | Time of examination | Type of examination | | |
| Final exam of module | Portfolio | 1 Portfolio | | |
| | PLEASE NOTE: Additional conditions regarding attendance and ungraded activities as determined by the persons responsible for the module will apply. | Voraussetzung für die Vergabe von Kreditpunkten ist die aktive Teilnahme an: S, Ü | | |
| | | ERGÄNZENDER HINWEIS: Zusätzlich gelten die von den Modulverantwortlichen festgelegten Rahmenbedingungen wie Anwesenheit und geforderte unbenotete Leistungen. | | |
| Course type | Comment | SWS | Frequency | Workload attendance |
| Lecture | | 2.00 | | 28 h |

| Course type | Comment | SWS | Frequency | Workload attendance |
|--|---------|------|-----------|---------------------|
| Exercises | | 5.00 | | 70 h |
| Seminar | | 3.00 | | 42 h |
| Total time of attendance for the module | | | | 140 h |

bio380 - Specific Microbiology

| | | | | |
|---|---|--|------------------|----------------------------|
| Module label | Specific Microbiology | | | |
| Module code | bio380 | | | |
| Credit points | 15.0 KP | | | |
| Workload | 450 h | | | |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Dual-Subject Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Master of Education Programme (Gymnasium) Biology (Master of Education) > Mastermodule | | | |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Ralf Andreas Rabus <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Ralf Andreas Rabus ◦ Kathleen Trautwein <p>Module counseling</p> <ul style="list-style-type: none"> ◦ Kathleen Trautwein | | | |
| Entry requirements | | | | |
| Skills to be acquired in this module | <p>++ biological knowledge ++ knowledge of biological working methods ++ biologically relevant knowledge in the natural sciences and mathematics + interdisciplinary knowledge & thinking ++ abstract, logical, analytical thinking ++ deepened expertise in biological specialist field + independent learning and (research-based) working + data presentation and evidence-based discussion (written and spoken) ++ teamwork + project and time management + knowledge of safety and environmental issues</p> <p>Emphasis on: Theory: Different cultivation strategies (batch, fed-batch, continuous) and physiological interpretation of measuring parameters (growth rates, respiration rates, yield) Practice: Knowledge of device and handling of bioreactors including sensor systems</p> | | | |
| Module contents | <p>Fundamentals of process-controlled cultivation in bioreactors Part A: Handling of bioreactors, determination of the k_L value (oxygen yield rate) Part B: Cultivation of marine bacteria under controlled conditions in a bioreactor, balance of metabolic activities</p> | | | |
| Reader's advisory | <p>Schmauder HP (1994) Methoden der Biotechnologie, Kapitel 3.2.2. Gustav Fischer Verlag Jena Chmiel H, Briechele S (1991) Bioprozesstechnik. Gustav Fischer Verlag Stuttgart</p> | | | |
| Links | <p>www.icbm.de/ammb/index.html</p> | | | |
| Language of instruction | <p>German</p> | | | |
| Duration (semesters) | <p>1 Semester</p> | | | |
| Module frequency | <p>jährlich</p> | | | |
| Module capacity | <p>unlimited</p> | | | |
| Modullevel | <p>AS (Akzentsetzung / Accentuation)</p> | | | |
| Modulart | <p>Wahlpflicht / Elective</p> | | | |
| Lern-/Lehrform / Type of program | | | | |
| Vorkenntnisse / Previous knowledge | | | | |
| Examination | Time of examination | Type of examination | | |
| Final exam of module | | <p>1 written examination (50%) 1 record (50%)</p> <p>PLEASE NOTE: Additional conditions regarding attendance and ungraded activities as determined by the persons responsible for the module will apply.</p> | | |
| Course type | Comment | SWS | Frequency | Workload attendance |
| Lecture | | 4.00 | | 56 h |
| Exercises | | 6.00 | | 84 h |

| Course type | Comment | SWS | Frequency | Workload attendance |
|--|---------|-----|-----------|---------------------|
| Seminar | | | | 0 h |
| Total time of attendance for the module | | | | 140 h |

bio400 - Basic Concepts in Neurobiology I

| | | | | |
|---|---|--|------------------|----------------------------|
| Module label | Basic Concepts in Neurobiology I | | | |
| Module code | bio400 | | | |
| Credit points | 15.0 KP | | | |
| Workload | 450 h | | | |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Bachelor's Programme Mathematics (Bachelor) > Nebenfachmodule • Dual-Subject Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Master of Education Programme (Gymnasium) Biology (Master of Education) > Mastermodule | | | |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Martin Greschner ◦ Karl-Wilhelm Koch <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Martin Greschner ◦ Karl-Wilhelm Koch ◦ Ulrike Janssen-Bienhold <p>Module counseling</p> <ul style="list-style-type: none"> ◦ Ulrike Janssen-Bienhold ◦ Christiane Richter-Landsberg ◦ Olaf Goldbaum | | | |
| Entry requirements | | | | |
| Skills to be acquired in this module | <p>++ biological knowledge ++ knowledge of biological working methods + abstract, logical, analytical thinking + deepened expertise in biological specialist field + data presentation and evidence-based discussion (written and spoken)</p> <p>Imparting basic knowledge and relations of neurobiology. Transfer achievement: Preparing scientific records from the results of independent experiments.</p> | | | |
| Module contents | <p>In its first part, the lecture (4 H/W) covers the molecular and cellular fundamentals of neurobiology, the electrical processes in nervous cells, the organization and development of the nervous system, its function explained by simple circuits as well as the sensorimotor integration underlying any behaviour.</p> <p>In the seminar (1 H/W), individual subjects of the lecture are consolidated. In the subsequent block laboratory course (6 H/W), this theoretical knowledge is verified under real-world conditions by simple experiments related to the subjects dealt with in the lecture. Unobjectionable scientific minutes are to be prepared of the experiments and the individual results are to be presented in a seminar paper.</p> | | | |
| Reader's advisory | Purves D. et al.: Neuroscience, Sinauer Associates, Sunderland USA, latest edition each. | | | |
| Links | http:// | | | |
| Language of instruction | German | | | |
| Duration (semesters) | 1 Semester | | | |
| Module frequency | jährlich | | | |
| Module capacity | unlimited | | | |
| Modullevel | AS (Akzentsetzung / Accentuation) | | | |
| Modulart | Wahlpflicht / Elective | | | |
| Lern-/Lehrform / Type of program | | | | |
| Vorkenntnisse / Previous knowledge | | | | |
| Examination | Time of examination | Type of examination | | |
| Final exam of module | | 1 written examination, signed minutes | | |
| | | PLEASE NOTE: Additional conditions regarding attendance and ungraded activities as determined by the persons responsible for the module will apply. | | |
| Course type | Comment | SWS | Frequency | Workload attendance |
| Lecture | | 4.00 | | 56 h |
| Exercises | | 6.00 | | 84 h |

| Course type | Comment | SWS | Frequency | Workload attendance |
|--|---------|------|-----------|---------------------|
| Tutorial | | 2.00 | | 28 h |
| Seminar | | 1.00 | | 14 h |
| Total time of attendance for the module | | | | 182 h |

bio410 - Basic Concepts in Neurobiology II

| | | | | |
|--|--|--|------------------|----------------------------|
| Module label | Basic Concepts in Neurobiology II | | | |
| Module code | bio410 | | | |
| Credit points | 15.0 KP | | | |
| Workload | 450 h | | | |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Dual-Subject Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Master of Education Programme (Gymnasium) Biology (Master of Education) > Mastermodule | | | |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Georg Martin Klump <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Georg Martin Klump ◦ Ulrike Langemann ◦ Christiane Margarete Thiel ◦ Christine Köppl <p>Module counseling</p> <ul style="list-style-type: none"> ◦ Ulrike Langemann ◦ Christiane Margarete Thiel ◦ Christine Köppl | | | |
| Entry requirements | | | | |
| Skills to be acquired in this module | <p>++ biological knowledge ++ knowledge of biological working methods + abstract, logical, analytical thinking + deepened expertise in biological specialist field + data presentation and evidence-based discussion (written and spoken)</p> <p>Basic knowledge and relations of sensory science, cognition, and motor functions are imparted. Transfer achievement: Presentation of personal experimental results.</p> | | | |
| Module contents | <p>The lecture covers the anatomy and function of simple sensory and motory systems as well as higher cognitive functions. Selected subjects are treated in more detail in the seminar. In the subsequent block practical course, this theoretical knowledge is verified under real-world conditions by simple experiments related to the subjects dealt with in the lecture including data analysis and presentation of results.</p> | | | |
| Reader's advisory | <p>Purves D, Augustine GJ, Fitzpatrick D, Hall WC, LaMantia AS, McNamara JO, White LE (2008) Neuroscience. Palgrave Macmillan</p> | | | |
| Links | | | | |
| Language of instruction | German | | | |
| Duration (semesters) | 1 Semester | | | |
| Module frequency | jährlich | | | |
| Module capacity | unlimited | | | |
| Modullevel | AS (Akzentsetzung / Accentuation) | | | |
| Modulart | Wahlpflicht / Elective | | | |
| Lern-/Lehrform / Type of program | | | | |
| Vorkenntnisse / Previous knowledge | | | | |
| Examination | Time of examination | Type of examination | | |
| Final exam of module | Written examination in the course of the semester vacation (usually in March) | 1 written examination | | |
| | | PLEASE NOTE: Additional conditions regarding attendance and ungraded activities as determined by the persons responsible for the module will apply. | | |
| Course type | Comment | SWS | Frequency | Workload attendance |
| Lecture | | 4.00 | | 56 h |
| Exercises | | 5.00 | | 70 h |
| Seminar | | 1.00 | | 14 h |
| Total time of attendance for the module | | | | 140 h |

bio390 - Plant molecular biology and genetics

| | | | | |
|---|---|-----|---------------------|---------------------|
| Module label | Plant molecular biology and genetics | | | |
| Module code | bio390 | | | |
| Credit points | 15.0 KP | | | |
| Workload | 450 h | | | |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Dual-Subject Bachelor's Programme Biology (Bachelor) > Akzentsetzungsmodule • Master of Education Programme (Gymnasium) Biology (Master of Education) > Mastermodule | | | |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Sascha Laubinger <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Sascha Laubinger | | | |
| Entry requirements | | | | |
| Skills to be acquired in this module | <p>++ biologische Fachkenntnisse ++ Kenntnisse biologischer Arbeitstechniken + biologierelevante naturwissenschaftliche/mathematische Grundkenntnisse + Statistik und wissenschaftliches Programmieren ++ fächerübergreifende(s) Kenntnisse & Denken ++ Abstraktes, logisches, analytisches Denken ++ vertiefte Fachkompetenz in biologischem Spezialgebiet ++ Selbstständiges Lernen und (forschendes) Arbeiten ++ Datenpräsentation und evidenzbasierte Diskussion in Wort und Schrift ++ Teamfähigkeit ++ (wissenschaftliche) Kommunikationsfähigkeit ++ Projekt- und Zeitmanagement + Kenntnisse von Sicherheits- und Umweltbelangen</p> <p>Das Modul dient, unter Einbezug moderner Methoden und Techniken, dem vertieften Erlernen der wissenschaftlichen Herangehensweise zur Lösung von Problemen im Bereich molekularen Pflanzenbiologie und Pflanzengenetik. Fachkompetenzen: Grundkenntnisse in Pflanzengenetik, Pflanze/Umwelt-Interaktionen und molekulare Grundlagen der Genregulation Methodenkompetenzen: Erlernen von molekularbiologischer Grundtechniken, selbständig angewandt Handlungskompetenzen: Präsentation von wissenschaftlichen Arbeiten, Vortragstechniken, Teamfähigkeit, Problemlösungskompetenzen</p> | | | |
| Module contents | <p>In der interaktiv gestalteten Vorlesung für die Teilnehmenden wird das Basiswissen vermittelt. Hauptfokus besteht dabei auf Pflanze/Umwelt-Interaktionen und die zugrundeliegenden molekularen Mechanismen der Genregulation in Pflanzen. Im Praktikum werden wir an ausgewählten Beispielen molekulare und genetische Techniken erlernen und durchführen (z.B. Mutantenanalysen, Isolation von RNA/DNA, Bestimmung der Genaktivität mittel qRT-PCR, Analyse von Spleißmustern, Methoden zur Bestimmung von Protein/Protein-Interaktionen). Zu Beginn des Moduls werden die molekularbiologische Techniken und neuste Entwicklungen im Rahmen eines Methodenseminars von den Studierenden vorgestellt Den Abschluss des Moduls bildet ein gemeinsames Literaturseminar, bei dem aktuelle Arbeiten zum oben genannten Themenkreis von den Studierenden vorgestellt und diskutiert werden.</p> | | | |
| Reader's advisory | Aktuelle Literaturvorschläge werden mit den Studierenden in der Vorbesprechung besprochen. | | | |
| Links | | | | |
| Languages of instruction | German, English | | | |
| Duration (semesters) | 1 Semester | | | |
| Module frequency | jährlich im Wintersemester | | | |
| Module capacity | 12 (16) | | | |
| Modullevel | AS (Akzentsetzung / Accentuation) | | | |
| Modulart | Wahlpflicht / Elective | | | |
| Lern-/Lehrform / Type of program | 3 SWS Vorlesung 3 SWS Seminar 4 SWS Übung | | | |
| Vorkenntnisse / Previous knowledge | | | | |
| Examination | Time of examination | | Type of examination | |
| Final exam of module | | | KL | |
| Course type | Comment | SWS | Frequency | Workload attendance |

| Course type | Comment | SWS | Frequency | Workload attendance |
|--|---------|------|-----------|---------------------|
| Lecture | | 3.00 | WiSe | 42 h |
| Seminar | | 3.00 | WiSe | 42 h |
| Practical | | 4.00 | WiSe | 56 h |
| Total time of attendance for the module | | | | 140 h |

Naturwissenschaftliche Grundlagen

bio150 - Statistics for Biologists

| | | | | |
|--|--|---|-----------|---------------------|
| Module label | Statistics for Biologists | | | |
| Module code | bio150 | | | |
| Credit points | 6.0 KP | | | |
| Workload | 180 h | | | |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Naturwissenschaftliche Grundlagen • Dual-Subject Bachelor's Programme Biology (Bachelor) > Ergänzungsmodule | | | |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Jutta Kretzberg <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Jutta Kretzberg | | | |
| Entry requirements | | | | |
| Skills to be acquired in this module | <p>+ knowledge of biological working methods ++ biologically relevant knowledge in the natural sciences and mathematics ++ statistics & scientific programming + interdisciplinary knowledge & thinking ++ abstract, logical, analytical thinking + independent learning and (research-based) working + data presentation and evidence-based discussion (written and spoken) + teamwork</p> <p>Knowledge in applied statistics Basic knowledge of programming language R Ability to plan, conduct and interpret statistical analysis of biological data</p> | | | |
| Module contents | Introduction to applied statistics - background and application in R: Logic, set theory, combinatorics, probability theory, distributions, descriptive statistics, inferential statistics, statistical tests, ANOVA, study design, Bayes' statistics, correlation, regression, curve fitting | | | |
| Reader's advisory | A detailed script for lecture and exercises is available in Stud.IP | | | |
| Links | | | | |
| Language of instruction | German | | | |
| Duration (semesters) | 1 Semester | | | |
| Module frequency | jährlich | | | |
| Module capacity | unlimited | | | |
| Reference text | Übungen mit R können auf einem eigenen Laptop oder im Rechnerraum absolviert werden | | | |
| Modullevel | EB (Ergänzungsbereich / Complementary) | | | |
| Modulart | Pflicht / Mandatory | | | |
| Lern-/Lehrform / Type of program | Vorlesung, Übung | | | |
| Vorkenntnisse / Previous knowledge | Schulmathematik, sicherer Umgang mit Computern | | | |
| Examination | Time of examination | Type of examination | | |
| Final exam of module | within two weeks after lecture time | written exam (+15% bonus points from exercises) | | |
| Course type | Comment | SWS | Frequency | Workload attendance |
| Lecture | | 2.00 | -- | 28 h |
| Exercises | | 2.00 | -- | 28 h |
| Total time of attendance for the module | | | | 56 h |

bio251 - Exercises in Biochemistry and Molecular Biology

| | | | | |
|--|--|------------|--|----------------------------|
| Module label | Exercises in Biochemistry and Molecular Biology | | | |
| Module code | bio251 | | | |
| Credit points | 6.0 KP | | | |
| Workload | 180 h | | | |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Naturwissenschaftliche Grundlagen • Dual-Subject Bachelor's Programme Biology (Bachelor) > Ergänzungsmodule | | | |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Alexander Scholten ◦ Karl-Wilhelm Koch <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Alexander Scholten ◦ Karl-Wilhelm Koch ◦ Sascha Laubinger ◦ Arne Nolte <p>Module counseling</p> <ul style="list-style-type: none"> ◦ Sascha Laubinger ◦ Arne Nolte | | | |
| Entry requirements | admission of BSc students in Biology | | | |
| Skills to be acquired in this module | ++ biological knowledge ++ knowledge of biological working methods + biologically relevant knowledge in the natural sciences and mathematics + abstract, logical, analytical thinking + data presentation and evidence-based discussion (written and spoken) + teamwork + knowledge of safety and environmental issues | | | |
| Module contents | General introduction to principles of laboratory work in Biochemistry and Cell Biology | | | |
| Reader's advisory | Script | | | |
| Links | | | | |
| Language of instruction | German | | | |
| Duration (semesters) | 1 Semester | | | |
| Module frequency | | | | |
| Module capacity | unlimited | | | |
| Modullevel | EB (Ergänzungsbereich / Complementary) | | | |
| Modulart | Pflicht / Mandatory | | | |
| Lern-/Lehrform / Type of program | Übunge, Seminar | | | |
| Vorkenntnisse / Previous knowledge | VL Biochemie und Zellbiologie | | | |
| Examination | Time of examination | | Type of examination | |
| Final exam of module | during semester | | written exam; additionally ungraded protocolls | |
| Course type | Comment | SWS | Frequency | Workload attendance |
| Seminar | | 1.00 | SuSe | 14 h |
| Exercises | | 3.00 | SuSe | 42 h |
| Total time of attendance for the module | | | | 56 h |

che101 - Basic Chemistry

| | | |
|---|---|---------------------|
| Module label | Basic Chemistry | |
| Module code | che101 | |
| Credit points | 6.0 KP | |
| Workload | 180 h | |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Naturwissenschaftliche Grundlagen • Bachelor's Programme Mathematics (Bachelor) > Nebenfachmodule • Dual-Subject Bachelor's Programme Biology (Bachelor) > Ergänzungsmodule | |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Oliver Janka <p>Module counseling</p> <ul style="list-style-type: none"> ◦ Thomas Müller ◦ Rüdiger Beckhaus | |
| Entry requirements | | |
| Skills to be acquired in this module | <p>Die Studierenden beherrschen die theoretischen Grundlagen der allgemeinen und anorganischen Chemie. Sie sind in der Lage, stöchiometrische Beziehungen selbstständig zu erkennen und zur Lösung theoretischer und laborpraktischer Aufgabenstellungen einzusetzen.</p> <p>Die Studierenden haben grundlegende Kenntnisse über Vorkommen, Darstellung und Eigenschaften der chemischen Elemente und kennen deren wichtigsten Verbindungen und Reaktionen. Die Gleichgewichte in wässriger Lösung sind Ihnen vertraut. Sie können Gleichgewichtseinstellungen zur Lösung kleiner analytischer Aufgabenstellungen einsetzen und diese Gleichgewichte formelhaft beschreiben. Dies schließt gekoppelte Gleichgewichte ein.</p> | |
| Module contents | <p>V: Experimentalvorlesung Allgemeine und Anorganische Chemie Aufbau des Periodensystems; Grundlagen der chemischen Bindung; Nomenklatur chemischer Verbindungen; stöchiometrische Gesetze; chemische Gleichgewichte; fundamentale Stoffchemie; Struktur wichtiger Verbindungen; Vorführung chemischer Experimente Übungen zu den Inhalten der Vorlesung</p> | |
| Reader's advisory | <p>Lehrbücher der allgemeinen und anorganischen Chemie, z.B. Riedel, Anorganische Chemie, de Gruyter; Holleman-Wiberg, Lehrbuch der Anorganischen Chemie, de Gruyter.</p> | |
| Links | | |
| Language of instruction | German | |
| Duration (semesters) | 1 Semester | |
| Module frequency | jährlich | |
| Module capacity | unlimited | |
| Reference text | 6 KP / WiSe: V 101, Ü 102 | |
| Modullevel | --- | |
| Modulart | je nach Studiengang Pflicht oder Wahlpflicht | |
| Lern-/Lehrform / Type of program | | |
| Vorkenntnisse / Previous knowledge | | |
| Examination | Time of examination | Type of examination |
| Final exam of module | Normalerweise 13. - 14. Woche | written exam (100%) |
| Course type | Seminar | |
| SWS | | |
| Frequency | | |
| Workload attendance | 0 h | |

che102 - Basic Chemistry Laboratory

| | | |
|---|---|---------------------|
| Module label | Basic Chemistry Laboratory | |
| Module code | che102 | |
| Credit points | 6.0 KP | |
| Workload | 180 h | |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Naturwissenschaftliche Grundlagen • Bachelor's Programme Mathematics (Bachelor) > Nebenfachmodule • Dual-Subject Bachelor's Programme Biology (Bachelor) > Ergänzungsmodule | |
| Contact person | Module responsibility <ul style="list-style-type: none"> ◦ Oliver Janka ◦ Rainer Koch | |
| Entry requirements | bestandene Klausur che101 (Nachweis chemischer Grundkenntnisse für Laborsicherheit) | |
| Skills to be acquired in this module | Die Studierenden beherrschen die praktischen Grundlagen der allgemeinen und anorganischen Chemie. Sie lernen die Arbeit im chemischen Labor anhand von Standardprozeduren kennen und machen sich mit den Grundregeln der chemischen Laborpraxis vertraut. Sie können die Durchführung und die Beobachtung chemischer Experimente nach den Regeln guter wissenschaftlicher Praxis dokumentieren und die Ergebnisse von Versuchen aussagekräftig und fundiert protokollieren. | |
| Module contents | V: Theoretische Grundlagen der im Praktikum durchgeführten Versuche PR: Einführung in die Laborpraxis: Erlernen wichtiger Standardprozeduren im chemischen Labor. | |
| Reader's advisory | Lehrbücher der allgemeinen und anorganischen Chemie, z.B. Riedel, Anorganische Chemie, de Gruyter; Holleman-Wiberg, Lehrbuch der Anorganischen Chemie, de Gruyter; Praktikumsskript. | |
| Links | | |
| Language of instruction | German | |
| Duration (semesters) | 1 Semester | |
| Module frequency | jährlich | |
| Module capacity | unlimited | |
| Reference text | 6 KP / WiSe: V 714, PR 713 | |
| Modullevel | --- | |
| Modulart | je nach Studiengang Pflicht oder Wahlpflicht | |
| Lern-/Lehrform / Type of program | | |
| Vorkenntnisse / Previous knowledge | | |
| Examination | Time of examination | Type of examination |
| Final exam of module | | not graded |
| Course type | Seminar | |
| SWS | | |
| Frequency | | |
| Workload attendance | 0 h | |

che190 - Basic Organic Chemistry

| | | |
|---|---|---------------------|
| Module label | Basic Organic Chemistry | |
| Module code | che190 | |
| Credit points | 6.0 KP | |
| Workload | 180 h | |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Naturwissenschaftliche Grundlagen • Bachelor's Programme Chemistry (Bachelor) > Aufbaumodule • Dual-Subject Bachelor's Programme Biology (Bachelor) > Ergänzungsmodule • Dual-Subject Bachelor's Programme Chemistry (Bachelor) > Aufbaumodule • Master of Education Programme (Special Needs Education) Chemistry (Master of Education) > Mastermodule • Master of Education Programme (Vocational and Business Education) Chemistry (Master of Education) > Mastermodule | |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Jens Christoffers <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Jens Christoffers ◦ Sven Doye ◦ Gerhard Hilt <p>Module counseling</p> <ul style="list-style-type: none"> ◦ Jens Christoffers ◦ Sven Doye ◦ Gerhard Hilt | |
| Entry requirements | | |
| Skills to be acquired in this module | <p>Kenntnisse Grundlegende Stoffsystematik der Organischen Chemie, Reaktionsweisen organischer Verbindungen, grundlegende Reaktionsmechanismen, Fertigkeiten Beherrschung der Grundlagen der Organischen Chemie: Stoffklassen, funktionelle Gruppen, Nomenklatur; Formulieren organisch-chemischer Reaktionsgleichungen, Transformationen funktioneller Gruppen, Aufbau von Kohlenstoff-Kohlenstoff-Bindungen; Benennung der Konfiguration chiraler Verbindungen</p> | |
| Module contents | <p>Mit dem Besuch dieses Moduls erwerben die Studierenden das Basiswissen der Organischen Chemie. Hierzu zählen insbesondere Kenntnisse über die Stoffsystematik, die Nomenklatur, eine Übersicht über funktionelle Gruppen, deren Herstellung und wichtigste Eigenschaften, die Stereochemie, die Reaktivität organischer Verbindungen, grundlegende Reaktionsmechanismen, wichtige synthetische Makromoleküle und die bedeutendsten Naturstoffklassen.</p> | |
| Reader's advisory | Wird in der Vorlesung bekannt gegeben | |
| Links | | |
| Language of instruction | German | |
| Duration (semesters) | 1 Semester | |
| Module frequency | jährlich | |
| Module capacity | unlimited | |
| Reference text | Empfohlene Belegung 3 (WiSe) | |
| Modullevel | AC (Aufbaucurriculum / Composition) | |
| Modulart | je nach Studiengang Pflicht oder Wahlpflicht | |
| Lern-/Lehrform / Type of program | V (4 SWS) | |
| Vorkenntnisse / Previous knowledge | | |
| Examination | Time of examination | Type of examination |
| Final exam of module | In der vorlesungsfreien Zeit entsprechend separater Ankündigung | written exam |
| Course type | Lecture | |
| SWS | 4.00 | |
| Frequency | WiSe | |
| Workload attendance | 56 h | |

che290 - Experimental Organic Chemistry

| | | | | |
|--|---|------|---------------------|---------------------|
| Module label | Experimental Organic Chemistry | | | |
| Module code | che290 | | | |
| Credit points | 6.0 KP | | | |
| Workload | 180 h | | | |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Naturwissenschaftliche Grundlagen • Dual-Subject Bachelor's Programme Biology (Bachelor) > Ergänzungsmodule • Dual-Subject Bachelor's Programme Chemistry (Bachelor) > Aufbaumodule • Master of Education Programme (Vocational and Business Education) Chemistry (Master of Education) > Mastermodule | | | |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Sven Doye <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Jürgen Martens ◦ Sven Doye ◦ Jens Christoffers <p>Module counseling</p> <ul style="list-style-type: none"> ◦ Jürgen Martens ◦ Jens Christoffers | | | |
| Entry requirements | Erfolgreiche Teilnahme am Modul "Grundvorlesung Organische Chemie" | | | |
| Skills to be acquired in this module | Den Studierenden soll der Ausbau ihrer grundlegenden Kenntnisse über die Reaktivität organischer Substanzen in Theorie und Praxis ermöglicht werden. | | | |
| Module contents | Mit diesem Modul bauen die Studierenden ihr Basiswissen der Organischen Chemie weiter aus und wenden es im Rahmen dieses Grundpraktikums im Labor an. Sie erwerben Basiskenntnisse aus dem Bereich der präparativen Organischen Chemie, indem sie grundlegende organische Reaktionen und Arbeitstechniken (z.B. Substitution, Eliminierung, Polymerisation, Veresterung, Extraktion, Dünnschichtchromatographie) durchführen. Die Studierenden werden in die Lage versetzt, unter sicherheits- und umweltrelevanten Gesichtspunkten fach- und ordnungsgemäß mit einfachen Chemikalien umzugehen. Sie erlangen grundlegende Fähigkeiten zur Präsentation wissenschaftlicher Sachverhalte in schriftlicher und mündlicher Form. | | | |
| Reader's advisory | | | | |
| Links | http://www.chemie.uni-oldenburg.de/oc... | | | |
| Language of instruction | German | | | |
| Duration (semesters) | 1 Semester | | | |
| Module frequency | jährlich | | | |
| Module capacity | unlimited | | | |
| Reference text | 6 KP / SoSe: PR 204, S 205 / 4. FS / Doye | | | |
| Modullevel | AC (Aufbaucurriculum) | | | |
| Modulart | Pflicht | | | |
| Lern-/Lehrform / Type of program | PR + SE (6 SWS) | | | |
| Vorkenntnisse / Previous knowledge | | | | |
| Examination | Time of examination | | Type of examination | |
| Final exam of module | Eine mündliche Prüfung von maximal 45 Minuten Dauer nach Abschluss des Praktikums und nach Terminvereinbarung mit einem der möglichen Prüfer spätestens zum Ende des Semesters | | KL | |
| Course type | Comment | SWS | Frequency | Workload attendance |
| Seminar | | 3.00 | | 42 h |
| Practical | | 3.00 | | 42 h |
| Total time of attendance for the module | | | | 84 h |

mat980 - Mathematics for the Life Sciences

| | | | | |
|--|--|---------------------|-----------|---------------------|
| Module label | Mathematics for the Life Sciences | | | |
| Module code | mat980 | | | |
| Credit points | 6.0 KP | | | |
| Workload | 180 h | | | |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Naturwissenschaftliche Grundlagen • Dual-Subject Bachelor's Programme Biology (Bachelor) > Ergänzungsmodule | | | |
| Contact person | Module responsibility <ul style="list-style-type: none"> ◦ Boris Vertman ◦ Frank Schöpfer Authorized examiners <ul style="list-style-type: none"> ◦ Peter Harmand | | | |
| Entry requirements | | | | |
| Skills to be acquired in this module | Aufbauend auf einem mittleren Abiturwissen werden Teile des Schulstoffs wiederholt (Ableitung und Integral), ergänzt (allgemeiner Abbildungsbegriff, Folgen und Reihen) und weiterentwickelt (Taylorreihe, Differentialgleichungen). Die Mathematik wird dabei im wesentlichen ohne Beweise als Handwerkszeug präsentiert. Die Ideen hinter den Begriffen und die Bedeutung der Ergebnisse werden jedoch ausführlich erklärt. Die Studierenden sollen - ihr Schulwissen wiederholen und festigen, - die Anwendung von Mathematik in der Biologie mit zahlreichen praktischen Übungsaufgaben lernen, - ihr allgemeines Wissen mathematischer Methoden und Modelle verbreitern und üben, - die grundlegenden Formen von diskreten und kontinuierlichen, ungebremsten und gebremsten Wachstumsprozessen kennenlernen, - erfahren, wie analytisches und abstraktes Denken bei dem Studium realer Probleme helfen kann. | | | |
| Module contents | Folgen und Konvergenz: Abbildungen und Funktionen, rekursiv definierte Folgen und diskrete Wachstumsmodelle, Konvergenz, Reihen. Reelle Funktionen: Grenzwert und Stetigkeit, Exponential- und trigonometrische Funktionen, Koordinatentransformationen. Differential- und Integralrechnung: Ableitung und Integral, Mittelwertsatz, Taylorentwicklung, Newton-Verfahren, Hauptsatz, uneigentliche Integrale. Differentialgleichungen: Einfache Differentialgleichungen 1. Ordnung (linear homogen, logistisch), Richtungsfeld, stationäre Zustände und Stabilität, Anwendungen. Differentialgleichungen höherer Ordnung und Systeme (Schwingungsgleichung, Lotka-Volterra-Modell). | | | |
| Reader's advisory | | | | |
| Links | | | | |
| Language of instruction | German | | | |
| Duration (semesters) | 1 Semester | | | |
| Module frequency | jährlich | | | |
| Module capacity | unlimited | | | |
| Reference text | 6 KP 1 V: 981, 1 Ü: 982 1. FS | | | |
| Modullevel | BC (Basiscurriculum / Base curriculum) | | | |
| Modulart | Wahlpflicht / Elective | | | |
| Lern-/Lehrform / Type of program | Vorlesung + Übung | | | |
| Vorkenntnisse / Previous knowledge | | | | |
| Examination | Time of examination | Type of examination | | |
| Final exam of module | Vorlesungsende | KL | | |
| Course type | Comment | SWS | Frequency | Workload attendance |
| Lecture | | 3.00 | | 42 h |
| Exercises | | 1.00 | | 14 h |
| Total time of attendance for the module | | | | 56 h |

phy910 - Physics for Students of Biology and Dual Subject Chemistry

| | | |
|---|--|-------------------------------|
| Module label | Physics for Students of Biology and Dual Subject Chemistry | |
| Module code | phy910 | |
| Credit points | 6.0 KP | |
| Workload | 180 h | |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Naturwissenschaftliche Grundlagen • Dual-Subject Bachelor's Programme Biology (Bachelor) > Ergänzungsmodule • Dual-Subject Bachelor's Programme Chemistry (Bachelor) > Aufbaumodule | |
| Contact person | Module responsibility <ul style="list-style-type: none"> ◦ Manuela Schiek ◦ Gerd Gülker | |
| Entry requirements | Keine | |
| Skills to be acquired in this module | Die Studierenden sollen folgende Fähigkeiten erlangen: Theorie: <ul style="list-style-type: none"> • Verständnis von Naturvorgängen und ihre mathematische Beschreibung • Erhebung und quantitative Analyse von Messdaten • Verständnis der physikalischen Grundlagen von Messapparaturen mit Schwerpunkt auf die in der Biologie häufig verwendeten Messinstrumente. Praxis <ul style="list-style-type: none"> • Vertiefung und Überprüfung ihrer theoretischen Kenntnisse aus Vorlesungen und Lehrbuch am eigenen Experiment • Teamfähigkeit durch gemeinsames Durchführen der Experimente handwerkliche Fähigkeiten beim Umgang mit Messapparaturen sachkenntliches Arbeiten mit Messanleitungen <ul style="list-style-type: none"> • Protokollierung einer Messung | |
| Module contents | Vorlesung und Praktikum geben eine Einführung in die Physik, wobei schwerpunktmäßig die grundlegenden Sachverhalte aus Mechanik, Optik, Elektrodynamik, Wärmelehre sowie Atom- und Kernphysik behandelt werden. Zusätzlich werden allgemeine Themen wie Messfehler und Fehlerrechnung behandelt. | |
| Reader's advisory | Giancoli, C.D., „Physik“, Verlag Pearson Studium Tipler, P.A., „Physik“, Spektrum Akademischer, Heidelberg Und ausgewählte Kapitel aus: Halliday, D., Resnick, R., Walker, J.: „Fundamentals of physics“, Wiley VCH Weltner, K., „Mathematik für Physiker 1+2“, Springer Verlag Außerdem speziell für das Praktikum: Anleitungsskript zum Praktikum Geschke, D., „Physikalisches Praktikum“, Teubner Walcher, W., „Praktikum der Physik“, Teubner Westphal W.H. , „Physikalisches Praktikum“, Vieweg | |
| Links | http://www.uni-oldenburg.de/physik/lehre/praktika/bio-che/bio/ | |
| Language of instruction | German | |
| Duration (semesters) | 1 Semester | |
| Module frequency | jährlich | |
| Module capacity | unlimited | |
| Modullevel | --- | |
| Modulart | je nach Studiengang Pflicht oder Wahlpflicht | |
| Lern-/Lehrform / Type of program | Vorlesung mit optionalem, jedoch dringlich empfohlenen Tutorium, Praktikum | |
| Vorkenntnisse / Previous knowledge | | |
| Examination | Time of examination | Type of examination |
| Final exam of module | Modulende | 1 written exam or 1 oral exam |
| Course type | Seminar | |

SWS

Frequency

Workload attendance

0 h

bio250 - Biochemistry

| | | | | |
|---|--|--|------------------|----------------------------|
| Module label | Biochemistry | | | |
| Module code | bio250 | | | |
| Credit points | 6.0 KP | | | |
| Workload | 180 h | | | |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Naturwissenschaftliche Grundlagen • Dual-Subject Bachelor's Programme Biology (Bachelor) > Ergänzungsmodule | | | |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Karl-Wilhelm Koch <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Karl-Wilhelm Koch ◦ Alexander Scholten <p>Module counseling</p> <ul style="list-style-type: none"> ◦ Alexander Scholten | | | |
| Entry requirements | | | | |
| Skills to be acquired in this module | <p>++ biological knowledge ++ knowledge of biological working methods + biologically relevant knowledge in the natural sciences and mathematics ++ abstract, logical, analytical thinking + independent learning and (research-based) working ++ data presentation and evidence-based discussion (written and spoken) ++ teamwork + (scientific) communication skills + project and time management + knowledge of safety and environmental issues</p> <p>The students have a survey of the arrangement, function, and biosynthesis of the most important substance classes and metabolic processes, learn basic experimental methods of biochemistry and are able to present and interpret experimental results.</p> | | | |
| Module contents | The module gives an introduction to conceptions and methods of biochemistry. | | | |
| Reader's advisory | General textbooks of Biochemistry, e.g.: Biochemie, Müller-Esterl Biochemie, Lubert Stryer Lehninger Prinzipien der Biochemie, David L. Nelson und Michael M. Cox Principles of Biochemistry, Horton et al. | | | |
| Links | | | | |
| Language of instruction | German | | | |
| Duration (semesters) | 1 Semester | | | |
| Module frequency | jährlich | | | |
| Module capacity | unlimited | | | |
| Modullevel | EB (Ergänzungsbereich / Complementary) | | | |
| Modulart | Wahlpflicht / Elective | | | |
| Lern-/Lehrform / Type of program | | | | |
| Vorkenntnisse / Previous knowledge | | | | |
| Examination | Time of examination | Type of examination | | |
| Final exam of module | Written examination following the end of lectures or end of the semester. | 1 written examination signed minutes | | |
| | | PLEASE NOTE: Additional conditions regarding attendance and ungraded activities as determined by the persons responsible for the module will apply. | | |
| Course type | Comment | SWS | Frequency | Workload attendance |
| Lecture | | 2.00 | | 28 h |
| Tutorial | | 0.00 | WiSe | 0 h |
| Seminar | | 1.00 | | 14 h |
| Practical | | 2.00 | | 28 h |

| Course type | Comment | SWS | Frequency | Workload attendance |
|--|---------|-----|-----------|---------------------|
| Total time of attendance for the module | | | | 70 h |

Abschlussmodul

bam - Bachelor's Thesis Module

| | | |
|---|--|---------------------|
| Module label | Bachelor's Thesis Module | |
| Module code | bam | |
| Credit points | 15.0 KP | |
| Workload | 450 h | |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Abschlussmodul | |
| Contact person | Module responsibility <ul style="list-style-type: none"> ◦ Lehrende der Biologie Authorized examiners <ul style="list-style-type: none"> ◦ Lehrende der Biologie | |
| Entry requirements | | |
| Skills to be acquired in this module | Successful completion of the Bachelor module demonstrates that students are able to work on a problem in the field of Biology within a fixed period applying scientific methods. ++ biological knowledge ++ knowledge of biological working methods + statistics & scientific programming + abstract, logical, analytical thinking ++ deepened expertise in biological specialist field ++ independent learning and (research-based) working ++ data presentation and evidence-based discussion (written and spoken) + (scientific) communication skills ++ project and time management | |
| Module contents | Preparing the Bachelor thesis Active participation in the seminar of the research group, in which the Bachelor's thesis is written | |
| Reader's advisory | Supervisors may supply an initial reading list with important literature. The students are expected to find and use further literature as needed. | |
| Links | | |
| Languages of instruction | German, English | |
| Duration (semesters) | 1 Semester | |
| Module frequency | halbjährlich | |
| Module capacity | unlimited | |
| Modullevel | Abschlussmodul (Abschlussmodul / Conclude) | |
| Modulart | Pflicht / Mandatory | |
| Lern-/Lehrform / Type of program | | |
| Vorkenntnisse / Previous knowledge | | |
| Examination | Time of examination | Type of examination |
| Final exam of module | Bachelor's thesis (12 CP) and accompanying seminar (3 CP) | |
| Course type | Seminar | |
| SWS | 1.00 | |
| Frequency | -- | |
| Workload attendance | 14 h | |

Frühere Module

che100 - Introduction to Chemistry

| | | | | |
|---|--|------------|---------------------|----------------------------|
| Module label | Introduction to Chemistry | | | |
| Module code | che100 | | | |
| Credit points | 12.0 KP | | | |
| Workload | 360 h | | | |
| Used in course of study | <ul style="list-style-type: none"> • Bachelor's Programme Biology (Bachelor) > Frühere Module • Bachelor's Programme Chemistry (Bachelor) > Basismodule • Dual-Subject Bachelor's Programme Biology (Bachelor) > Frühere Module • Dual-Subject Bachelor's Programme Chemistry (Bachelor) > Basismodule | | | |
| Contact person | <p>Module responsibility</p> <ul style="list-style-type: none"> ◦ Thomas Müller ◦ Rüdiger Beckhaus <p>Authorized examiners</p> <ul style="list-style-type: none"> ◦ Rüdiger Beckhaus ◦ Thomas Müller <p>Module counseling</p> <ul style="list-style-type: none"> ◦ Alexander Weiz | | | |
| Entry requirements | Dokumentierte Teilnahme an der Sicherheitsbelehrung vor Beginn des Praktikums | | | |
| Skills to be acquired in this module | <p>Die Studierenden haben nach intensivem Durcharbeiten des Moduls: • den Aufbau der Atome sowie des Periodensystems verstanden, • die chemische Bindung im Hinblick auf die grundlegende Bindungstheorie verstanden, • den Unterschied verschiedener Reaktionsarten und deren Mechanismus verstanden und • ein grundlegendes Wissen über wichtige Verbindungen im Alltag, Industrie und Technik erworben. Fertigkeiten (Können) Vorlesung Die Studierenden können nach intensivem Durcharbeiten des Moduls: • die unterschiedlichen Typen der chemischen Bindung zuordnen, • chemische Verbindungen systematisch benennen, • Reaktionsgleichungen aufstellen und ausgleichen, • sowie die unterschiedlichen Reaktionstypen zuordnen. Praktikum Sie lernen die Arbeit im chemischen Labor anhand von Standardprozeduren kennen und machen sich mit den Grundregeln der chemischen Laborpraxis vertraut. Sie sind in der Lage, stöchiometrische Beziehungen selbstständig zu erkennen und zur Lösung theoretischer und laborpraktischer Aufgabenstellungen einzusetzen. Die Studierenden haben grundlegende Kenntnisse über Vorkommen, Darstellung und Eigenschaften der chemischen Elemente und kennen deren wichtigste Verbindungen und Reaktionen.</p> | | | |
| Module contents | <p>Vorlesung Experimentalvorlesung zur Allgemeinen und Anorganischen Chemie: • Aufbau der Atome • Aufbau des Periodensystems • Grundlagen der chemischen Bindung • Nomenklatur chemischer Verbindungen • stöchiometrische Gesetze • chemische Gleichgewichte • Säure- / Basereaktionen • Redoxreaktionen • Komplexbildungen • Struktur wichtiger Verbindungen • Fundamental Stoffchemie • Vorführung chemischer Experimente Praktikum • Einführung in die Laborpraxis: Erlernen wichtiger Standardprozeduren im chemischen Labor. Übungen • Übungen zu den Inhalten der Vorlesung, Klausurvorbereitung</p> | | | |
| Reader's advisory | | | | |
| Links | | | | |
| Language of instruction | German | | | |
| Duration (semesters) | 1 Semester | | | |
| Module frequency | jährlich | | | |
| Module capacity | unlimited | | | |
| Reference text | WiSe | | | |
| Modullevel | BC (Basiscurriculum / Base curriculum) | | | |
| Modulart | Pflicht / Mandatory | | | |
| Lern-/Lehrform / Type of program | VL (4 SWS) + PR (6 SWS) + SEM (1 SWS) | | | |
| | Interaktive Tafelvorlesung, fachliche Inhalte werden durch passende Experimente verdeutlicht. | | | |
| Vorkenntnisse / Previous knowledge | | | | |
| Examination | Time of examination | | Type of examination | |
| Final exam of module | In der vorlesungsfreien Zeit entsprechend separater Ankündigung | | KL | |
| Course type | Comment | SWS | Frequency | Workload attendance |
| Lecture | | 4.00 | | 56 h |

| Course type | Comment | SWS | Frequency | Workload attendance |
|--|---------|------|-----------|---------------------|
| Exercises | | 1.00 | | 14 h |
| Practical | | 6.00 | | 84 h |
| Seminar | | | | 0 h |
| Total time of attendance for the module | | | | 154 h |

