# Modules for Biology

## Mastermodule

### bio100 - Introduction into Didactics of Biology

<table>
<thead>
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<th>Module label</th>
<th>Introduction into Didactics of Biology</th>
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<tbody>
<tr>
<td>Module code</td>
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<tr>
<td>Credit points</td>
<td>6.0 KP</td>
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<tr>
<td>Workload</td>
<td>180 h</td>
</tr>
<tr>
<td>Used in course of study</td>
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</table>
- Master of Education (Sonderpädagogik Biologie > Mastermodule
- Zwei-Fächer-Bachelor Biologie > Aufbaumodule |
| Contact person |  
- Module responsibility
  - Corinna Hößle
- Authorized examiners
  - Corinna Hößle
  - Wiebke Rathje
  - Bianca Kuhlemann
- Module counceling
  - Wiebke Rathje |
| Entry requirements |  
- Skills to be acquired in this module:
The students will be introduced to the basics of didactics of biology. In the beginning the focus will lie on the standards of education and school-curriculums. Afterwards scientific methods, different methods of education, media, social forms and the culture of problem solving in biological classes will be reflected and realized by concrete examples out of everyday practice (micro-teaching). During the second half of the module the students will be able to conceive and reflect own concepts of teaching. Furthermore the possibilities of studying in out-of-school-facilities will be fathomed, excursions planned, realized and reflected.

- Importance of this module during the studies:
  Teaching skills for all fields of study (compulsory subject for following degrees: teaching post in primary school (Grundschule), extended elementary school (Hauptschule) and secondary school (Realschule)). |
| Module contents |  
- 3. semester: seminar
  - Introduction to curricular standards, media, methods, social forms, concepts of pupils, instruments of diagnosis, natural scientific methods, culture of exercises in biological classes. Construction of teaching that considers social matters and the environment of the pupils.
- 4. semester: seminar and excursions
  - Forms and places for teaching biology, methods and media for teaching biological contents in different spheres of activity (scientific museums, botanical and zoological gardens, regional environmental centers, the Wadden Sea national park).
| Reader's advisory |  
| Links |  
- Language of instruction: German
- Duration (semesters): 2 Semester
- Module frequency: jährlich
- Module capacity: unlimited
- Modulelevel: AM (Aufbaumodul)
- Modulart: Pflicht
- Lern-/Lehrform / Type of program: Seminar
- Vorkenntnisse / Previous knowledge: 
- Examination: 
  - Time of examination: Papers have to be presented or handed in: one week after the end of the course
  - Type of examination: 1 Presentation (50%), 1 oral exam (50%)
| Frequency       | Workload attendance | 56 h |
Bio110 - Practical Biology Experiments for Science Education

<table>
<thead>
<tr>
<th>Module label</th>
<th>Practical Biology Experiments for Science Education</th>
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</thead>
<tbody>
<tr>
<td>Module code</td>
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<td>6.0 KP</td>
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<tr>
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**Used in course of study**
- Master of Education (Gymnasium) Biologie > Mastermodule
- Master of Education (Sonderpädagogik) Biologie > Mastermodule
- Zwei-Fächer-Bachelor Biologie > Aufbaumodule

**Contact person**
- Module responsibility
  - Corinna Hößle
  - N. N.
- Authorized examiners
  - Corinna Hößle
  - Wiebke Rathje
- Module counseling
  - Wiebke Rathje

**Entry requirements**

**Skills to be acquired in this module**

**Module contents**

**Reader's advisory**

**Links**

**Language of instruction**
- German

**Duration (semesters)**
- 1 Semester

**Module frequency**
- jährlich

**Module capacity**
- unlimited

**Module level**
- MM (Mastermodul)

**Moduleart**
- Ergänzung/Professionalisierung

**Lern-/Lehrform / Type of program**

**Vorkenntnisse / Previous knowledge**

**Examination**

**Final Exam of module**

<table>
<thead>
<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload attendance</th>
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<td>Seminar</td>
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<td>Practical</td>
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**Total time of attendance for the module**
- 70 h
bio120 - Science-Teaching and Learning in School-Labs

**Module label**  
Science-Teaching and Learning in School-Labs

**Module code**  
bio120

**Credit points**  
3.0 KP

**Workload**  
90 h

**Used in course of study**  
- Master of Education (Gymnasium) Biologie > Mastermodule
- Master of Education (Haupt- und Realschule) Biologie > Mastermodule
- Master of Education (Sonderpädagogik) Biologie > Mastermodule

**Contact person**  
Module responsibility
- Corinna Hößle

**Authorized examiners**
- Corinna Hößle
- Birgit Weusmann
- Holger Winkler
- Anja Wübben
- Bianca Kuhlemann

**Module counseling**
- Birgit Weusmann
- Holger Winkler
- Anja Wübben

**Entry requirements**

**Skills to be acquired in this module**

**Module contents**

**Reader's advisory**

**Links**

**Language of instruction**  
German

**Duration (semesters)**  
1 Semester

**Module frequency**  
halbjährlich

**Module capacity**  
unlimited

**Modullevel**  
MM (Mastermodul)

**Modulart**  
Pflicht

**Lern-/Lehrform / Type of program**

**Vorkenntnisse / Previous knowledge**

**Examination**

**Time of examination**

**Type of examination**

**Final exam of module**

1 unbenotetes Portfolio (Entwicklung eines Kurzentwurfes samt Arbeitsblättern/Forschertagebuch und eines Diagnosebogens, Durchführung und Reflektion eines Lernarrangements)

**Course type**

**Comment**  
SWS

**Frequency**

**Workload attendance**

<table>
<thead>
<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
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<td>SuSe</td>
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**Total time of attendance for the module**

28 h
bio130 - Human Biology Experiments for Science Education

Module label: Human Biology Experiments for Science Education
Module code: bio130
Credit points: 6.0 KP
Workload: 180 h

Used in course of study:
- Master of Education (Gymnasium) Biologie > Mastermodule
- Master of Education (Haupt- und Realschule) Biologie > Mastermodule
- Master of Education (Sonderpädagogik) Biologie > Mastermodule

Contact person:
- Module responsibility
  - Corinna Hößle
- Authorized examiners
  - Corinna Hößle
  - Wiebke Rathje
- Module counseling
  - Wiebke Rathje

Entry requirements:

Skills to be acquired in this module:

Module contents:

Reader's advisory:

Links:

Language of instruction: German
Duration (semesters): 1 Semester
Module frequency: jährlich
Module capacity: unlimited
Modullevel: MM (Mastermodul)
Modulart: Pflicht

Lern-/Lehrform / Type of program:

Vorkenntnisse / Previous knowledge:

Examination:

<table>
<thead>
<tr>
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Final exam of module:

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<td>Lecture</td>
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<td>Practical</td>
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<td>56 h</td>
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Total time of attendance for the module: 70 h
bio245 - Flora and Fauna

Module label: Flora and Fauna
Module code: bio245
Credit points: 9.0 KP
Workload: 270 h

Used in course of study:
- Master of Education (Sonderpädagogik) Biologie > Mastermodule
- Zwei-Fächer-Bachelor Biologie > Aufbaumodule

Contact person:
Module responsibility:
- Dirk Carl Albach
- Thomas Glatzel

Authorized examiners:
- Dirk Carl Albach
- Thomas Glatzel
- Klaus Bernhard von Hagen

Module counseling:
- Klaus Bernhard von Hagen

Entry requirements:
Skills to be acquired in this module:
- Biological knowledge
- Knowledge of biological working methods
- Independent learning and (research-based) working
- Knowledge of safety and environmental issues

To determine species-rich taxa and to verify the results independently using relevant literature

Module contents:
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.

Reader's advisory:
Botany:
Rothmaler - Exkursionsflora von Deutschland, Band 2 - Grundband, Spektrum Akademischer Verlag

Zoology:
M. Schaefer: Brohmer - Fauna von Deutschland, from 20th edition

Links:
Language of instruction: German
Duration (semesters): 2 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:
- Botany: Written examination before the end of the lecture
- Zoology: Written examination before the end of the lecture

Type of examination:
- 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:
- Lecture
- Exercises
- Study trip

Comment:
- 2.00
- 4.00
- 1.00

SWS:
- 28 h
- 56 h
- 14 h

Workload:
- 98 h
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<th>Skills to be acquired in this module</th>
<th>Module contents</th>
<th>Reader's advisory</th>
<th>Links</th>
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<td>Vorkenntnisse / Previous knowledge</td>
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<td></td>
<td>Examination</td>
<td>Time of examination</td>
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### bio279 - Basic Concepts in Animal Physiology

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<tr>
<td>Workload</td>
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| Used in course of study | • Master Engineering Physics > Schwerpunkt: Biomedical Physics  
                        | • Master of Education (Sonderpädagogik) Biologie > Mastermodule |

**Contact person**

- Module responsibility
  - Dominik Heyers

- Authorized examiners
  - Dominik Heyers
  - Christine Köppl
  - Karin Dedek

- Module counseling
  - Christine Köppl
  - Karin Dedek

**Entry requirements**

- Skills to be acquired in this module
  - ++ 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

  Basic knowledge on physiological processes and their underlying mechanisms with a focus on human physiology. Performing, analysing and documenting physiological experiments.

**Module contents**

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.

**Reader's advisory**

- Klinke, Pape, Kurtz, Silbernagl: Physiologie, Aufl. 6, 2010
- Schmidt, Lang, Heckmann: Physiologie des Menschen mit Pathophysiologie, Aufl. 31, 2011
  (if available: Wehner, Gehring: Zoologie)

**Links**

- 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**

<table>
<thead>
<tr>
<th>Examination</th>
<th>Time of examination</th>
<th>Type of examination</th>
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<tbody>
<tr>
<td>Final exam of module</td>
<td>within a few weeks after the winter term lecture period</td>
<td>written exam (100%)</td>
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</table>

To qualify for the exam, the following additional requirements need to be met:

- 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 protocols. The decision whether a given protocol deserves the bonus lies with the respective supervisor of each experiment. 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.

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

<table>
<thead>
<tr>
<th>Examination</th>
<th>Time of examination</th>
<th>Type of examination</th>
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**Course type**
- Lecture

**SWS**
- 4.00

**Frequency**

**Workload attendance**
- 56 h
**bio289 - Plant Physiology**

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<td>Workload</td>
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<td>Used in course of study</td>
<td>Master of Education (Sonderpädagogik) Biologie &gt; Mastermodule</td>
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**Contact person**
- Module responsibility
- Sascha Laubinger
- Authorized examiners
  - Sascha Laubinger
  - Gerhard Wolfgang Zotz
- Module counseling
  - Gerhard Wolfgang Zotz

**Entry requirements**
++ 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

**Module contents**

**Reader's advisory**

**Links**

<table>
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<th>Language of instruction</th>
<th>German</th>
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<tbody>
<tr>
<td>Duration (semesters)</td>
<td>1 Semester</td>
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<tr>
<td>Module frequency</td>
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<td>Modullevel</td>
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<td>je nach Studiengang Pflicht oder Wahlpflicht</td>
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**Examination / Type of program**

**Vorkenntnisse / Previous knowledge**

**Final exam of module**

<table>
<thead>
<tr>
<th>Course type</th>
<th>Comment</th>
<th>SWS</th>
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<tbody>
<tr>
<td>Seminar</td>
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<tr>
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<td>WiSe</td>
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**Total time of attendance for the module**
0 h
bio299 - Genetics

Module label: Genetics
Module code: bio299
Credit points: 6.0 KP
Workload: 180 h

Used in course of study:
- Master of Education (Sonderpädagogik) Biologie > Mastermodule

Contact person:
- Module responsibility: Maike Claußen
- Authorized examiners:
  - Maike Claußen
  - Hans Gerd Nothwang
  - Anna-Maria Hartmann
- Module counseling:
  - Anna-Maria Hartmann
  - Hans Gerd Nothwang

Entry requirements:
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
- ++ 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:
Reader's advisory
Links

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 ungraded report

<table>
<thead>
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<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload attendance</th>
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<tbody>
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<td>Lecture</td>
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<td>Practical</td>
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<td>Exercises</td>
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Total time of attendance for the module: 84 h
# Abschlussmodul

**mam - Master´s Thesis Module**

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<td>Module level</td>
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<td>Lern-Lehrform / Type of program</td>
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<td>Vorkenntnisse / Previous knowledge</td>
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<tr>
<td>Examination</td>
<td>Time of examination</td>
</tr>
<tr>
<td>Final exam of module</td>
<td>Type of examination</td>
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<td>SWS</td>
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<td>Workload attendance</td>
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Frühere Module

bio295 - Genetics

Module label: Genetics
Module code: bio295
Credit points: 9.0 KP
Workload: 270 h

Used in course of study:
- Fach-Bachelor Biologie > Aufbaumodule
- Master of Education (Sonderpädagogik) Biologie > Frühere Module
- Zwei-Fächer-Bachelor Biologie > Aufbaumodule

Contact person:
Module responsibility:
- Maike Claußen

Authorized examiners:
- Maike Claußen
- Hans Gerd Nothwang
- Anna-Maria Hartmann
- Lena Ebbers

Module counseling:
- Anna-Maria Hartmann
- Hans Gerd Nothwang
- Lena Ebbers

Entry requirements:

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
++ 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

Fundamentals of genetics, performing experiments, quantitative analyses.

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:

Links:

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: lecture, seminar, exercise

Vorkenntnisse / Previous knowledge:

Examination:
Time of examination: Time of examination
Type of examination: Written examination (100%), ungraded presentation, protocol

Final exam of module:

Course type: Lecture
Comment: 1.50
SWS: 1.50
Frequency: WiSe
Workload attendance: 21 h

Course type: Exercises
Comment: 3.00
SWS: 3.00
Frequency: WiSe
Workload attendance: 42 h
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<th>Comment</th>
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<td>Seminar</td>
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<td>1.50</td>
<td>WiSe</td>
<td>21 h</td>
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**Total time of attendance for the module**: 84 h