

Subdivided Module Catalogue  
for the Subject

# Didactics in Physics (Secondary School)

as Didaktikfach  
with the degree "Erste Staatsprüfung für das Lehramt für  
Sonderpädagogik"

Examination regulations version: 2009  
Responsible: Faculty of Physics and Astronomy

## Abbreviations used

Course types: **E** = field trip, **K** = colloquium, **O** = conversatorium, **P** = placement/lab course, **R** = project, **S** = seminar, **T** = tutorial, **Ü** = exercise, **V** = lecture

Term: **SS** = summer semester, **WS** = winter semester

Methods of grading: **NUM** = numerical grade, **B/NB** = (not) successfully completed

Regulations: **(L)ASPO** = general academic and examination regulations (for teaching-degree programmes), **FSB** = subject-specific provisions, **SFB** = list of modules

Other: **A** = thesis, **LV** = course(s), **PL** = assessment(s), **TN** = participants, **VL** = prerequisite(s)

## Conventions

Unless otherwise stated, courses and assessments will be held in German, assessments will be offered every semester and modules are not creditable for bonus.

## Notes

Should there be the option to choose between several methods of assessment, the lecturer will agree with the module coordinator on the method of assessment to be used in the current semester by two weeks after the start of the course at the latest and will communicate this in the customary manner.

Should the module comprise more than one graded assessment, all assessments will be equally weighted, unless otherwise stated below.

Should the assessment comprise several individual assessments, successful completion of the module will require successful completion of all individual assessments.

## In accordance with

the general regulations governing the degree subject described in this module catalogue:

**LASPO2009**

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

**20-Feb-2013 (2012-77)**

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

## The subject is divided into

| Abbreviation  | Module title   | ECTS credits | Method of grading | page |
|---|--|--------------|-------------------|------|
| <b>Compulsory Courses (20 ECTS credits)</b>   |  |              |                   |      |
| Successful completion of modules worth 20 ECTS credits in each subject selected as Didaktikfach (subject studied with a focus on teaching methodology) is a prerequisite for admission to the Erste Staatsprüfung (First State Examination) in the subject Didaktiken einer Fächergruppe der Hauptschule (Didactics of a Group of Subjects of Hauptschule). |  |              |                   |      |
| 11-P-SP1-092-m01  | Physics 1 for Primary and Secondary General School                           | 5            | NUM               | 7    |
| 11-P-SP2-092-m01  | Physics 2 for Primary and Secondary General School                           | 5            | NUM               | 8    |
| 11-P-SP3-092-m01  | Physics 3 for Primary and Secondary General School                           | 5            | NUM               | 9    |
| 11-P-FDDRI-092-m01  | Teaching Physics in Primary and Secondary General School                     | 5            | NUM               | 4    |
| <b>Freier Bereich (general as well as subject-specific electives)</b>   |  |              |                   |      |
| Teaching degree students must take modules worth a total of 15 ECTS credits in the area Freier Bereich (general as well as subject-specific electives) (Section 9 LASPO (general academic and examination regulations for teaching-degree programmes)). To achieve the required number of ECTS credits, students may take any modules from the areas below. |  |              |                   |      |
| Freier Bereich -- interdisciplinary: The interdisciplinary additional offer for a teaching degree can be found in the respective Annex "Ergänzende Bestimmungen für den "Freien Bereich" im Rahmen des Studiums für ein Lehramt".   |  |              |                   |      |
| 11-P-FB-LLL-121-m01   | Student Lab Supervision (Physics)  | 2            | B/NB              | 5    |
| 11-MIND-Ph1-121-m01   | Low Cost - High Impact. Low-Budget Experiments for Science Courses (Physics) | 2            | B/NB              | 6    |
| 11-MIND-Ph2-121-m01   | Teaching Science with Hands-on-Exhibits (Physics)                            | 2            | B/NB              | 10   |

| Module title   |                   | Abbreviation                                   |
|--|-------------------|--|
| Teaching Physics in Primary and Secondary General School   |                   | 11-P-FDDRI-092-m01                             |
| Module coordinator   |                   | Module offered by                              |
| holder of the Chair of Physics and its Didactics   |                   | Faculty of Physics and Astronomy               |
| ECTS   | Method of grading | Only after succ. compl. of module(s)           |
| 5  | numerical grade   | --   |
| Duration   | Module level      | Other prerequisites                            |
| 1 semester   | undergraduate     | Prior completion of module 11-P-E recommended. |
| Contents   |                   |  |
| Justification/legitimation of physics education, educational goals of physics, qualification models and educational standards: elementarisation and didactic reconstruction of physical contents, methods of physics education, media in physics education and their application to support learning. Interdisciplinary aspects of selected topics of biology, chemistry, geography and physics education, corresponding student preconceptions and typical learning difficulties, elementarisation and didactic reconstruction of scientific contents, based on specific contents of school classes.  |                   |  |
| Intended learning outcomes   |                   |  |
| Knowledge of the legitimation and learning goals of Physics classes; knowledge of possibilities of elementarisation and of methods of Physics classes, knowledge of physical teaching and working material. Advanced qualitative understanding of school-relevant scientific topic areas; knowledge of common approaches, typical student preconceptions and special media on selected topics.   |                   |  |
| Courses (type, number of weekly contact hours, language — if other than German)  |                   |  |
| Einführung Fachdidaktik 2 (Introduction to Didactics 2): V (1 weekly contact hour) + Ü (1 weekly contact hour), once a year (summer semester)<br>Fächerübergreifender Unterricht (Teaching Interdisciplinary Contents): S (2 weekly contact hours), once a year (summer semester)  |                   |  |
| Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)  |                   |  |
| <p>This module has the following assessment components</p> <ol style="list-style-type: none"> <li>Topics covered in lectures and exercises (Einführung Fachdidaktik 2 (Introduction to Didactics 2)): written examination (approx. 45 minutes) or term paper (approx. 8 pages) or presentation (approx. 30 minutes) or oral examination of one candidate each (approx. 10 minutes) or oral examination in groups (approx. 20 minutes, groups of 2 candidates).</li> <li>Seminar (Fächerübergreifender Unterricht (Teaching Interdisciplinary Contents)): term paper (approx. 8 pages) or presentation (approx. 45 minutes) or log of a class (approx. 6 pages) or written examination (approx. 45 minutes) or oral examination of one candidate each (approx. 15 minutes) or oral examination in groups (approx. 30 minutes).</li> </ol> <p>Students must register for assessment components 1 and 2 online (details to be announced).<br/>To pass this module, students must pass both assessment component 1 and assessment component 2.</p> |                   |  |
| Allocation of places   |                   |  |
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| Additional information   |                   |  |
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| Referred to in LPO I (examination regulations for teaching-degree programmes)  |                   |  |
| § 36 (1) 7. Didaktik der Grundschule Physik<br>§ 38 (1) 1. Didaktik der Hauptschule Physik<br>§ 38 (1) 1. Didaktik der Mittelschule Physik<br>§ 53 (1) 2. Physik Fachdidaktik<br>§ 77 (1) 2. Physik Fachdidaktik   |                   |  |

| Module title  |                              | Abbreviation   |
|---|------------------------------|--|
| <b>Student Lab Supervision (Physics)</b>  |                              | 11-P-FB-LLL-121-m01  |
| Module coordinator  |                              | Module offered by  |
| holder of the Chair of Physics and its Didactics  |                              | Faculty of Physics and Astronomy   |
| ECTS  | Method of grading            | Only after succ. compl. of module(s)   |
| 2   | (not) successfully completed | --   |
| Duration  | Module level                 | Other prerequisites  |
| 1 semester  | undergraduate                | This module can be chosen by students studying at least one subject in the natural sciences. |
| <b>Contents</b>   |                              |  |
| The module provides an introduction to successful supervision of pupils independently carrying out experiments in the teaching-learning-laboratory.   |                              |  |
| <b>Intended learning outcomes</b>   |                              |  |
| The students learn to classify different groups of pupils according to their subject-specific and experimental level of performance, to support the pupils according to their needs and age and to help them during independent experimenting (supervision competencies in open classroom situations). The students are able to methodically and critically evaluate their own actions. A lecturer gives individual feedback to the students to avoid negative behaviour patterns and to support the students' strengths. The students develop professional behaviour patterns by repeatedly working on the same topic with different groups of pupils (reflection competencies and self-control competencies). |                              |  |
| <b>Courses</b> (type, number of weekly contact hours, language — if other than German)  |                              |  |
| S (no information on SWS (weekly contact hours) and course language available)  |                              |  |
| <b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)  |                              |  |
| a) written examination (approx. 45 minutes) or b) term paper (approx. 8 pages, time to complete: 1 to 4 weeks) or c) examination of one candidate each (approx. 10 minutes) or d) examination in groups (approx. 20 minutes, groups of 2)   |                              |  |
| <b>Allocation of places</b>   |                              |  |
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| <b>Additional information</b>   |                              |  |
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| <b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)  |                              |  |
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| Module title  |                              |  | Abbreviation        |
|---|------------------------------|--|---------------------|
| Low Cost - High Impact. Low-Budget Experiments for Science Courses (Physics)  |                              |  | 11-MIND-Ph1-121-m01 |
| Module coordinator  |                              | Module offered by  |                     |
| holder of the Chair of Physics and its Didactics  |                              | Faculty of Physics and Astronomy   |                     |
| ECTS  | Method of grading            | Only after succ. compl. of module(s)   |                     |
| 2   | (not) successfully completed | --   |                     |
| Duration  | Module level                 | Other prerequisites  |                     |
| 1 semester  | undergraduate                | This module can be chosen by students studying at least one subject in the natural sciences. |                     |
| Contents  |                              |  |                     |
| Conception and realisation of experimental stations with ordinary and inexpensive consumables for classes of Grundschule and secondary level I.   |                              |  |                     |
| Intended learning outcomes  |                              |  |                     |
| The students develop simple scientific experimenting stations to use for the transition from primary to secondary level I for small groups from different types of schools. In doing so, they learn to simplify and convey scientific contents relevant to the curriculum in due consideration of the target group. |                              |  |                     |
| Courses (type, number of weekly contact hours, language — if other than German)   |                              |  |                     |
| S (no information on SWS (weekly contact hours) and course language available)  |                              |  |                     |
| Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)   |                              |  |                     |
| a) written examination (approx. 45 minutes) or b) term paper (approx. 8 pages, time to complete: 1 to 4 weeks) or c) examination of one candidate each (approx. 10 minutes) or d) examination in groups (approx. 20 minutes, groups of 2)   |                              |  |                     |
| Allocation of places  |                              |  |                     |
| --  |                              |  |                     |
| Additional information  |                              |  |                     |
| --  |                              |  |                     |
| Referred to in LPO I (examination regulations for teaching-degree programmes)   |                              |  |                     |
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| Module title   |                   | Abbreviation   |
|--|-------------------|--|
| Physics 1 for Primary and Secondary General School   |                   | 11-P-SP1-092-m01   |
| Module coordinator   |                   | Module offered by  |
| holder of the Chair of Physics and its Didactics   |                   | Faculty of Physics and Astronomy   |
| ECTS   | Method of grading | Only after succ. compl. of module(s)   |
| 5  | numerical grade   | --   |
| Duration   | Module level      | Other prerequisites  |
| 1 semester   | undergraduate     | Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew. |
| Contents   |                   |  |
| Physical contents (mechanics, thermodynamics) relevant to classes in Natural Sciences or technical-natural sciences in Grund- and Hauptschule.   |                   |  |
| Intended learning outcomes   |                   |  |
| Qualitative knowledge of the physical principles of school-relevant contents of scientific or technical-scientific classes in Grund- and Hauptschule; knowledge of typical approaches to the implementation and evaluation of demonstration and pupils experiments.  |                   |  |
| Courses (type, number of weekly contact hours, language — if other than German)  |                   |  |
| V + Ü (no information on SWS (weekly contact hours) and course language available)   |                   |  |
| Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)  |                   |  |
| a) written examination (approx. 90 minutes) or b) oral examination of one candidate each (approx. 15 minutes) or oral examination in groups (groups of 2, approx. 30 minutes)<br>Assessment offered: When and how often assessment will be offered depends on the method of assessment and will be announced in due form under observance of Section 32 Subsection 3 ASPO (general academic and examination regulations) 2009. |                   |  |
| Allocation of places   |                   |  |
| --   |                   |  |
| Additional information   |                   |  |
| --   |                   |  |
| Referred to in LPO I (examination regulations for teaching-degree programmes)  |                   |  |
| § 36 (1) 7. Didaktik der Grundschule Physik<br>§ 38 (1) 1. Didaktik der Hauptschule Physik<br>§ 38 (1) 1. Didaktik der Mittelschule Physik   |                   |  |

| Module title   |                   | Abbreviation   |
|--|-------------------|--|
| Physics 2 for Primary and Secondary General School   |                   | 11-P-SP2-092-m01   |
| Module coordinator   |                   | Module offered by  |
| holder of the Chair of Physics and its Didactics   |                   | Faculty of Physics and Astronomy   |
| ECTS   | Method of grading | Only after succ. compl. of module(s)   |
| 5  | numerical grade   | --   |
| Duration   | Module level      | Other prerequisites  |
| 1 semester   | undergraduate     | Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew. |
| Contents   |                   |  |
| Physical contents (science of electricity, electronics) relevant to classes in Natural Sciences or technical-natural sciences in Grund- and Hauptschule.   |                   |  |
| Intended learning outcomes   |                   |  |
| Qualitative knowledge of the physical principles of school-relevant contents of scientific or technical-scientific classes in Grund- and Hauptschule; knowledge of typical approaches to the implementation and evaluation of demonstration and pupils experiments.  |                   |  |
| Courses (type, number of weekly contact hours, language — if other than German)  |                   |  |
| V + Ü (no information on SWS (weekly contact hours) and course language available)   |                   |  |
| Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)  |                   |  |
| a) written examination (approx. 90 minutes) or b) oral examination of one candidate each (approx. 15 minutes) or oral examination in groups (groups of 2, approx. 30 minutes)<br>Assessment offered: When and how often assessment will be offered depends on the method of assessment and will be announced in due form under observance of Section 32 Subsection 3 ASPO (general academic and examination regulations) 2009. |                   |  |
| Allocation of places   |                   |  |
| --   |                   |  |
| Additional information   |                   |  |
| --   |                   |  |
| Referred to in LPO I (examination regulations for teaching-degree programmes)  |                   |  |
| § 36 (1) 7. Didaktik der Grundschule Physik<br>§ 38 (1) 1. Didaktik der Hauptschule Physik<br>§ 38 (1) 1. Didaktik der Mittelschule Physik   |                   |  |



| Module title   |                   | Abbreviation   |
|--|-------------------|--|
| Physics 3 for Primary and Secondary General School   |                   | 11-P-SP3-092-m01   |
| Module coordinator   |                   | Module offered by  |
| holder of the Chair of Physics and its Didactics   |                   | Faculty of Physics and Astronomy   |
| ECTS   | Method of grading | Only after succ. compl. of module(s)   |
| 5  | numerical grade   | --   |
| Duration   | Module level      | Other prerequisites  |
| 1 semester   | undergraduate     | Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew. |
| Contents   |                   |  |
| Physical contents (optics, acoustics, Atomic and Nuclear Physics) relevant to classes in Natural Sciences or technical-natural sciences in Grund- and Hauptschule.   |                   |  |
| Intended learning outcomes   |                   |  |
| Qualitative knowledge of the physical principles of school-relevant contents of scientific or technical-scientific classes in Grund- and Hauptschule; knowledge of typical approaches to the implementation and evaluation of demonstration and pupils experiments.  |                   |  |
| Courses (type, number of weekly contact hours, language — if other than German)  |                   |  |
| V + Ü (no information on SWS (weekly contact hours) and course language available)   |                   |  |
| Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)  |                   |  |
| a) written examination (approx. 90 minutes) or b) oral examination of one candidate each (approx. 15 minutes) or oral examination in groups (groups of 2, approx. 30 minutes)<br>Assessment offered: When and how often assessment will be offered depends on the method of assessment and will be announced in due form under observance of Section 32 Subsection 3 ASPO (general academic and examination regulations) 2009. |                   |  |
| Allocation of places   |                   |  |
| --   |                   |  |
| Additional information   |                   |  |
| --   |                   |  |
| Referred to in LPO I (examination regulations for teaching-degree programmes)  |                   |  |
| § 36 (1) 7. Didaktik der Grundschule Physik<br>§ 38 (1) 1. Didaktik der Hauptschule Physik<br>§ 38 (1) 1. Didaktik der Mittelschule Physik   |                   |  |

| Module title   |                              | Abbreviation   |
|--|------------------------------|--|
| Teaching Science with Hands-on-Exhibits (Physics)  |                              | 11-MIND-Ph2-121-m01  |
| Module coordinator   |                              | Module offered by  |
| holder of the Chair of Physics and its Didactics   |                              | Faculty of Physics and Astronomy   |
| ECTS   | Method of grading            | Only after succ. compl. of module(s)   |
| 2  | (not) successfully completed | --   |
| Duration   | Module level                 | Other prerequisites  |
| 1 semester   | undergraduate                | This module can be chosen by students studying at least one subject in the natural sciences. |
| <b>Contents</b>  |                              |  |
| Designing and creating hands-on exhibits for STEM subjects.  |                              |  |
| <b>Intended learning outcomes</b>  |                              |  |
| The students evaluate the advantages and disadvantages of the hands-on approach for teaching scientific contents in and out of school. They plan and implement an interdisciplinary science exhibition as an example of project-oriented work with pupils of secondary level I and II. |                              |  |
| <b>Courses</b> (type, number of weekly contact hours, language — if other than German)   |                              |  |
| S (no information on SWS (weekly contact hours) and course language available)   |                              |  |
| <b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)   |                              |  |
| a) written examination (approx. 45 minutes) or b) term paper (approx. 8 pages, time to complete: 1 to 4 weeks) or c) examination of one candidate each (approx. 10 minutes) or d) examination in groups (approx. 20 minutes, groups of 2)  |                              |  |
| <b>Allocation of places</b>  |                              |  |
| --   |                              |  |
| <b>Additional information</b>  |                              |  |
| --   |                              |  |
| <b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)   |                              |  |
| --   |                              |  |