Module Catalogue
for the Module studies (Master)
Quantum Technology

Examination regulations version: 2021
Responsible: Faculty of Physics and Astronomy
Contents

The subject is divided into
Abbreviations used, Conventions, Notes, In accordance with

Winter Term 2021
Current Topics in Physik
Current Topics in Physik
Current Topics in Physik
Current Topics in Physik
Current Topics in Physik
Current Topics in Quantum Technology
Current Topics in Quantum Technology
Current Topics in Quantum Technology
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Current Topics in Quantum Technology
Advanced Topics in Solid State Physics
Advanced Topics in Physics
Advanced Topics in Quantum Technology

Summer Term 2022
Current Topics in Physik
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Current Topics in Quantum Technology
Current Topics in Quantum Technology
Current Topics in Quantum Technology
Current Topics in Quantum Technology
Advanced Topics in Solid State Physics
Advanced Topics in Physics
Advanced Topics in Quantum Technology

Winter Term 2022
Current Topics in Physik
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Current Topics in Quantum Technology
Current Topics in Quantum Technology
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Current Topics in Quantum Technology
Current Topics in Quantum Technology
Advanced Topics in Solid State Physics
Advanced Topics in Physics
Advanced Topics in Quantum Technology
The subject is divided into

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<td>Winter Term 2022</td>
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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:

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

15-May-2019 (2019-36)
27-Jun-2019 (2019-41)
14-Nov-2019 (2019-52)
22-Jan-2020 (2020-13)
06-May-2020 (2020-39)
22-Jul-2020 (2020-57)
17-Dec-2020 (2020-110)
10-Mar-2021 (2021-17)
09-Jun-2021 (2021-58)
22-Dec-2021 (2021-85)
05-Jul-2022 (2022-52)

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.
Winter Term 2021
(0 ECTS credits)
### Module title
Current Topics in Physik

### Abbreviation
11-EXP6-161-m01

### Module coordinator
chairperson of examination committee

### Module offered by
Faculty of Physics and Astronomy

### ECTS
6

### Method of grading
numerical grade

### Only after succ. compl. of module(s)
--

### Duration
1 semester

### Module level
graduate

### Other prerequisites
Approval from examination committee required.

### Contents
Current topics in experimental or theoretical physics. Credited academic achievements, e.g. in case of change of university or study abroad.

### Intended learning outcomes
The students have advanced competencies corresponding to the requirements of a module of Experimental or Theoretical Physics of the Master's programme of Nanostructure Technology. They have knowledge of a current subdiscipline of Physics and understand the measuring and/or calculation methods necessary to acquire this knowledge. They are able to classify the subject-specific contexts and know the application areas.

### Courses
V (3) + R (1)

### Method of assessment
a) written examination (approx. 90 to 120 minutes) or b) oral examination of one candidate each (approx. 30 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes per candidate) or d) project report (approx. 8 to 10 pages) or e) presentation/talk (approx. 30 minutes).

If a written examination was chosen as method of assessment, this may be changed and assessment may instead take the form of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is changed, the lecturer must inform students about this by four weeks prior to the original examination date at the latest.

Language of assessment: German and/or English

### Allocation of places
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### Additional information
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### Referred to in LPO I
(examination regulations for teaching-degree programmes)

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**Module coordinator**

Chairperson of examination committee

**Module offered by**

Faculty of Physics and Astronomy

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**Duration**

1 semester

**Module level**

Graduate

**Other prerequisites**

Approval from examination committee required.

**Contents**

Current topics in Experimental or Theoretical Physics. Credited academic achievements, e.g. in case of change of university or study abroad.

**Intended learning outcomes**

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

V (3) + R (1)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (approx. 90 to 120 minutes) or b) oral examination of one candidate each (approx. 30 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes per candidate) or d) project report (approx. 8 to 10 pages) or e) presentation/talk (approx. 30 minutes).

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Language of assessment: German and/or English

**Allocation of places**

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**Additional information**

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

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Module title | Abbreviation
---|---
Current Topics in Physik | 11-EXP5-161-m01

Module coordinator | Module offered by
chairperson of examination committee | 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 | graduate | Approval from examination committee required.

Contents
Current topics in Experimental or Theoretical Physics. Credited academic achievements, e.g. in case of change of university or study abroad.

Intended learning outcomes
The students have advanced competencies corresponding to the requirements of a module of Experimental or Theoretical Physics of the Master's programme of Nanostructure Technology. They have knowledge of a current subdiscipline of Physics and understand the measuring and/or calculation methods necessary to acquire this knowledge. They are able to classify the subject-specific contexts and know the application areas.

Courses (type, number of weekly contact hours, language — if other than German)
V (2) + R (2)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)
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Language of assessment: German and/or English

Allocation of places
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Additional information
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**Contents**

Current topics of Experimental and Theoretical Physics. Accredited academic achievements, e.g. in case of change of university or study abroad.

**Intended learning outcomes**

The students have advanced competencies corresponding to the requirements of a module of Experimental or Theoretical Physics of the Master's programme of Nanostructure Technology. They have knowledge of a current subdiscipline of Physics and understand the measuring and/or calculation methods necessary to acquire this knowledge. They are able to classify the subject-specific contexts and know the application areas.

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

V (3) + R (1)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

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Language of assessment: German and/or English

**Allocation of places**

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**Additional information**

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

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**Contents**

Current topics of Experimental and Theoretical Physics. Accredited academic achievements, e.g. in case of change of university or study abroad.

**Intended learning outcomes**

The students have advanced competencies corresponding to the requirements of a module of Experimental or Theoretical Physics of the Master’s programme of Nanostructure Technology. They have knowledge of a current subdiscipline of Physics and understand the measuring and/or calculation methods necessary to acquire this knowledge. They are able to classify the subject-specific contexts and know the application areas.

**Courses**

(type, number of weekly contact hours, language — if other than German)  
V (4) + R (2)

**Method of assessment**

(type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

- written examination (approx. 90 to 120 minutes) or oral examination of one candidate each (approx. 30 minutes)  
- or oral examination in groups (groups of 2, approx. 30 minutes per candidate) or project report (approx. 8 to 10 pages) or presentation/talk (approx. 30 minutes).

If a written examination was chosen as method of assessment, this may be changed and assessment may instead take the form of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is changed, the lecturer must inform students about this by four weeks prior to the original examination date at the latest.

Language of assessment: German and/or English

**Allocation of places**

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**Additional information**

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**Referred to in LPO I**

(examination regulations for teaching-degree programmes)

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Module title: Current Topics in Quantum Technology  
Abbreviation: 11-EXN5-212-m01

Module coordinator: chairperson of examination committee  
Module offered by: Faculty of Physics and Astronomy

ECTS: 5  
Method of grading: numerical grade  
Only after succ. compl. of module(s): --

Duration: 1 semester  
Module level: graduate  
Other prerequisites: Approval from examination committee required.

Contents:
Current topics in experimental or theoretical physics. Credited academic achievements, e.g. in case of change of university or study abroad.

Intended learning outcomes:
The student possesses advanced knowledge meeting the requirements of a module in theoretical or experimental physics on Master's level in the study programme Quantum Technology. He/She commands knowledge in a current field in physics and insight into the measuring and calculating methods which are necessary to acquire this knowledge. He/She is able to classify and to link the learnt. He/She knows about fields of application.

Courses:
V (2) + R (2)  
Module taught in: German or English

Method of assessment:
written examination (approx. 90 to 120 minutes) or  
oral examination of one candidate each (approx. 30 minutes) or  
oral examination in groups (groups of 2, approx. 30 minutes per candidate) or  
project report (approx. 8 to 10 pages) or  
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Language of assessment: German and/or English

Allocation of places: --

Additional information: --

Referred to in LPO I: (examination regulations for teaching-degree programmes) --
Module title | Current Topics in Quantum Technology
---|---
Abbreviation | 11-EXN6-212-m01

Module coordinator | chairperson of examination committee
Module offered by | Faculty of Physics and Astronomy

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Contents

Current topics in experimental or theoretical physics. Credited academic achievements, e.g. in case of change of university or study abroad.

Intended learning outcomes

The student possesses advanced knowledge meeting the requirements of a module in theoretical or experimental physics on Master’s level in the study programme Quantum Technology. He/She commands knowledge in a current field in physics and insight into the measuring and calculating methods which are necessary to acquire this knowledge. He/She is able to classify and to link the learnt. He/She knows about fields of application.

Courses

V (3) + R (1)
Module taught in: German or English

Method of assessment

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

written examination (approx. 90 to 120 minutes) or
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Language of assessment: German and/or English

Allocation of places

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Additional information

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Referred to in LPO I

(examination regulations for teaching-degree programmes)

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Module title  
Current Topics in Quantum Technology

Abbreviation  
11-EXN7-212-m01

Module coordinator  
chairperson of examination committee

Module offered by  
Faculty of Physics and Astronomy

ECTS  
7

Method of grading  
Only after succ. compl. of module(s)

Duration  
1 semester

Module level  
graduate

Other prerequisites  
Approval from examination committee required.

Contents  
Current topics in experimental or theoretical physics. Credited academic achievements, e.g. in case of change of university or study abroad.

Intended learning outcomes  
The student possesses advanced knowledge meeting the requirements of a module in theoretical or experimental physics on Master’s level in the study programme Quantum Technology. He/She commands knowledge in a current field in physics and insight into the measuring and calculating methods which are necessary to acquire this knowledge. He/She is able to classify and to link the learnt. He/She knows about fields of application.

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

V (3) + R (1)

Module taught in: German or English

Method of assessment  
(type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

written examination (approx. 90 to 120 minutes) or
oral examination of one candidate each (approx. 30 minutes) or
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Language of assessment: German and/or English

Allocation of places  
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Additional information  
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Referred to in LPO I  
(examination regulations for teaching-degree programmes)

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Module title | Abbreviation
---|---
Current Topics in Quantum Technology | 11-EXN8-212-m01

Module coordinator | Module offered by
chairperson of examination committee | Faculty of Physics and Astronomy

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

Duration | Module level | Other prerequisites
1 semester | graduate | Approval from examination committee required.

Contents
Current topics in experimental or theoretical physics. Credited academic achievements, e.g. in case of change of university or study abroad.

Intended learning outcomes
The student possesses advanced knowledge meeting the requirements of a module in theoretical or experimental physics on Master's level in the study programme Quantum Technology. He/She commands knowledge in a current field in physics and insight into the measuring and calculating methods which are necessary to acquire this knowledge. He/She is able to classify and to link the learnt. He/She knows about fields of application.

Courses (type, number of weekly contact hours, language — if other than German)
V (4) + R (2)
Module taught in: German or English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

written examination (approx. 90 to 120 minutes) or
oral examination of one candidate each (approx. 30 minutes) or
oral examination in groups (groups of 2, approx. 30 minutes per candidate) or
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presentation/talk (approx. 30 minutes).

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Language of assessment: German and/or English

Allocation of places
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Additional information
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Referred to in LPO I (examination regulations for teaching-degree programmes)
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### Module title
Current Topics in Quantum Technology

### Abbreviation
11-EXN6A-212-m01

### Module coordinator
chairperson of examination committee

### Module offered by
Faculty of Physics and Astronomy

### ECTS
6

### Method of grading
numerical grade

### Only after succ. compl. of module(s)
--

### Duration
1 semester

### Module level
graduate

### Other prerequisites
Approval from examination committee required.

### Contents
Current topics in experimental or theoretical physics. Credited academic achievements, e.g. in case of change of university or study abroad.

### Intended learning outcomes
The student possesses advanced knowledge meeting the requirements of a module in theoretical or experimental physics on Master's level in the study programme Quantum Technology. He/She commands knowledge in a current field in physics and insight into the measuring and calculating methods which are necessary to acquire this knowledge. He/She is able to classify and to link the learnt. He/She knows about fields of application.

### Courses (type, number of weekly contact hours, language — if other than German)
V (3) + R (1)

### Module taught in:
German or English

### Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)
- written examination (approx. 90 to 120 minutes) or
- oral examination of one candidate each (approx. 30 minutes) or
- oral examination in groups (groups of 2, approx. 30 minutes per candidate) or
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Language of assessment: German and/or English

### Allocation of places
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### Additional information
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### Referred to in LPO I (examination regulations for teaching-degree programmes)
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# Advanced Topics in Solid State Physics

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<tr>
<td>Managing Director of the Institute of Theoretical Physics and Astrophysics</td>
<td>Faculty of Physics and Astronomy</td>
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## Contents

This module will enable the lecturers of Condensed Matter Physics to teach advanced courses on topics not covered in any of the other modules. These topics may relate either to recent research developments or to subjects not included in the regular curriculum.

## Intended learning outcomes

The students advance their knowledge and understanding of an advanced topic of Condensed Matter Physics and acquire insights into the connections between research and teaching.

## Courses

(V (3) + R (1))

## Method of assessment

(a) written examination (approx. 90 to 120 minutes) or (b) oral examination of one candidate each (approx. 30 minutes) or (c) oral examination in groups (groups of 2, approx. 30 minutes per candidate) or (d) project report (approx. 8 to 10 pages) or (e) presentation/talk (approx. 30 minutes).

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Language of assessment: German and/or English

## Allocation of places

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## Additional information

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## Referred to in LPO I

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**Contents**

This module will enable lecturers of Physics to teach advanced courses on topics not covered in any of the other modules. These topics may relate either to recent research developments or to subjects not included in the regular curriculum.

**Intended learning outcomes**

The students advance their knowledge and understanding of an advanced topic of nanostructure technology and acquire insights into the connections between research and teaching.

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

| V (3) + R (1) |

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

- written examination (approx. 90 to 120 minutes) or oral examination of one candidate each (approx. 30 minutes) or oral examination in groups (groups of 2, approx. 30 minutes per candidate) or project report (approx. 8 to 10 pages) or presentation/talk (approx. 30 minutes).

- If a written examination was chosen as method of assessment, this may be changed and assessment may instead take the form of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is changed, the lecturer must inform students about this by four weeks prior to the original examination date at the latest.

Language of assessment: German and/or English

**Allocation of places**

- 

**Additional information**

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

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Quantum Technology (2021)
<table>
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<td>11-CSNM-212-m01</td>
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<td>Managing Director of the Institute of Theoretical Physics and Astrophysics</td>
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**Contents**

This module allows lecturers of the quantum technology study programme to give lectures on advanced topics that cannot be covered by any other module. These lectures may either reflect new developments in research or deal with topics that are not included in the regular teaching cycle.

**Intended learning outcomes**

The students deepen their knowledge and understanding of an advanced topic in quantum technology, thereby gaining insights into the interface between research and teaching.

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

V (3) + R (1)
Module taught in: German or English

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

- written examination (approx. 90 to 120 minutes) or
- oral examination of one candidate each (approx. 30 minutes) or
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Language of assessment: German and/or English

**Allocation of places**

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**Additional information**

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

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**Module coordinator**

chairperson of examination committee

**Module offered by**

Faculty of Physics and Astronomy

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**Contents**

Current topics in experimental or theoretical physics. Credited academic achievements, e.g. in case of change of university or study abroad.

**Intended learning outcomes**

The students have advanced competencies corresponding to the requirements of a module of Experimental or Theoretical Physics of the Master's programme of Nanostructure Technology. They have knowledge of a current subdiscipline of Physics and understand the measuring and/or calculation methods necessary to acquire this knowledge. They are able to classify the subject-specific contexts and know the application areas.

**Courses**

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

V (3) + R (1)

**Method of assessment**

(type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (approx. 90 to 120 minutes) or b) oral examination of one candidate each (approx. 30 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes per candidate) or d) project report (approx. 8 to 10 pages) or e) presentation/talk (approx. 30 minutes).

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Language of assessment: German and/or English

**Allocation of places**

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**Additional information**

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**Referred to in LPO I**

(examination regulations for teaching-degree programmes)

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Contents

Current topics in Experimental or Theoretical Physics. Credited academic achievements, e.g. in case of change of university or study abroad.

Intended learning outcomes

The students have advanced competencies corresponding to the requirements of a module of Experimental or Theoretical Physics of the Master's programme of Nanostructure Technology. They have knowledge of a current subdiscipline of Physics and understand the measuring and/or calculation methods necessary to acquire this knowledge. They are able to classify the subject-specific contexts and know the application areas.

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

V (3) + R (1)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

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Language of assessment: German and/or English

Allocation of places

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Additional information

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| Duration   | Module level       | |
|------------|--------------------| |
| 1 semester | graduate           | |

Contents

Current topics in Experimental or Theoretical Physics. Credited academic achievements, e.g. in case of change of university or study abroad.

Intended learning outcomes

The students have advanced competencies corresponding to the requirements of a module of Experimental or Theoretical Physics of the Master's programme of Nanostructure Technology. They have knowledge of a current subdiscipline of Physics and understand the measuring and/or calculation methods necessary to acquire this knowledge. They are able to classify the subject-specific contexts and know the application areas.

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

V (2) + R (2)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

written examination (approx. 90 to 120 minutes) or oral examination of one candidate each (approx. 30 minutes) or oral examination in groups (groups of 2, approx. 30 minutes per candidate) or project report (approx. 8 to 10 pages) or presentation/talk (approx. 30 minutes).

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Language of assessment: German and/or English

Allocation of places

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Additional information

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Quantum Technology (2021)
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**Module coordinator**

chairperson of examination committee

**Module offered by**

Faculty of Physics and Astronomy

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**Duration**

1 semester

**Module level**

graduate

**Contents**

Current topics of Experimental and Theoretical Physics. Accredited academic achievements, e.g. in case of change of university or study abroad.

**Intended learning outcomes**

The students have advanced competencies corresponding to the requirements of a module of Experimental or Theoretical Physics of the Master's programme of Nanostructure Technology. They have knowledge of a current subdiscipline of Physics and understand the measuring and/or calculation methods necessary to acquire this knowledge. They are able to classify the subject-specific contexts and know the application areas.

**Courses**

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

V (4) + R (2)

**Method of assessment**

(type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

written examination (approx. 90 to 120 minutes) or oral examination of one candidate each (approx. 30 minutes) or oral examination in groups (groups of 2, approx. 30 minutes per candidate) or project report (approx. 8 to 10 pages) or presentation/talk (approx. 30 minutes).

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Language of assessment: German and/or English

**Allocation of places**

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**Additional information**

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**Referred to in LPO I**

(examination regulations for teaching-degree programmes)

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**Module coordinator**
chairperson of examination committee

**Module offered by**
Faculty of Physics and Astronomy

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**Duration**
1 semester

**Module level**
graduate

**Other prerequisites**
Approval from examination committee required.

**Contents**
Current topics in experimental or theoretical physics. Credited academic achievements, e.g. in case of change of university or study abroad.

**Intended learning outcomes**
The student possesses advanced knowledge meeting the requirements of a module in theoretical or experimental physics on Master's level in the study programme Quantum Technology. He/She commands knowledge in a current field in physics and insight into the measuring and calculating methods which are necessary to acquire this knowledge. He/She is able to classify and to link the learnt. He/She knows about fields of application.

**Courses**
V (2) + R (2)
Module taught in: German or English

**Method of assessment**
written examination (approx. 90 to 120 minutes) or
oral examination of one candidate each (approx. 30 minutes) or
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Language of assessment: German and/or English

**Allocation of places**
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**Additional information**
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**Referred to in LPO I**
(examination regulations for teaching-degree programmes)
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Module title: Current Topics in Quantum Technology
Abbreviation: 11-EXN6-212-m01

Module coordinator: chairperson of examination committee
Module offered by: Faculty of Physics and Astronomy

ECTS: 6
Method of grading: numerical grade
Only after succ. compl. of module(s):

Duration: 1 semester
Module level: graduate
Other prerequisites: Approval from examination committee required.

Contents:
Current topics in experimental or theoretical physics. Credited academic achievements, e.g. in case of change of university or study abroad.

Intended learning outcomes:
The student possesses advanced knowledge meeting the requirements of a module in theoretical or experimental physics on Master's level in the study programme Quantum Technology. He/She commands knowledge in a current field in physics and insight into the measuring and calculating methods which are necessary to acquire this knowledge. He/She is able to classify and to link the learnt. He/She knows about fields of application.

Courses:
V (3) + R (1)
Module taught in: German or English

Method of assessment:
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Language of assessment: German and/or English

Allocation of places:

Additional information:

Referred to in LPO 1 (examination regulations for teaching-degree programmes):

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Module title | Abbreviation
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Current Topics in Quantum Technology | 11-EXN7-212-m01

Module coordinator | Module offered by
chairperson of examination committee | Faculty of Physics and Astronomy

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

Duration | Module level | Other prerequisites
1 semester | graduate | Approval from examination committee required.

Contents

Current topics in experimental or theoretical physics. Credited academic achievements, e.g. in case of change of university or study abroad.

Intended learning outcomes

The student possesses advanced knowledge meeting the requirements of a module in theoretical or experimental physics on Master’s level in the study programme Quantum Technology. He/She commands knowledge in a current field in physics and insight into the measuring and calculating methods which are necessary to acquire this knowledge. He/She is able to classify and to link the learnt. He/She knows about fields of application.

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

V (3) + R (1)
Module taught in: German or English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

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Language of assessment: German and/or English

Allocation of places

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Additional information

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

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**Contents**

Current topics in experimental or theoretical physics. Credited academic achievements, e.g. in case of change of university or study abroad.

**Intended learning outcomes**

The student possesses advanced knowledge meeting the requirements of a module in theoretical or experimental physics on Master's level in the study programme Quantum Technology. He/She commands knowledge in a current field in physics and insight into the measuring and calculating methods which are necessary to acquire this knowledge. He/She is able to classify and to link the learnt. He/She knows about fields of application.

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

V (4) + R (2)
Module taught in: German or English

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

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Language of assessment: German and/or English

**Allocation of places**

--

Additional information

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

--
Module title: Current Topics in Quantum Technology
Abbreviation: 11-EXN6A-212-m01

Module coordinator: chairperson of examination committee
Module offered by: Faculty of Physics and Astronomy

ECTS: 6
Method of grading: numerical grade
Duration: 1 semester
Module level: graduate
Other prerequisites: Approval from examination committee required.

Contents:
Current topics in experimental or theoretical physics. Credited academic achievements, e.g. in case of change of university or study abroad.

Intended learning outcomes:
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Courses:
V (3) + R (1)
Module taught in: German or English

Method of assessment:
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Language of assessment: German and/or English

Allocation of places:
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Additional information:
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Referred to in LPO I: (examination regulations for teaching-degree programmes)
Module title | Abbreviation
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Advanced Topics in Solid State Physics | 11-CSFM-161-m01

Module coordinator | Module offered by
Managing Director of the Institute of Theoretical Physics and Astrophysics | Faculty of Physics and Astronomy

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Duration | Module level | Other prerequisites
1 semester | graduate | Approval from examination committee required.

Contents
This module will enable the lecturers of Condensed Matter Physics to teach advanced courses on topics not covered in any of the other modules. These topics may relate either to recent research developments or to subjects not included in the regular curriculum.

Intended learning outcomes
The students advance their knowledge and understanding of an advanced topic of Condensed Matter Physics and acquire insights into the connections between research and teaching.

Courses (type, number of weekly contact hours, language — if other than German)
V (3) + R (1)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (approx. 90 to 120 minutes) or b) oral examination of one candidate each (approx. 30 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes per candidate) or d) project report (approx. 8 to 10 pages) or e) presentation/talk (approx. 30 minutes).

If a written examination was chosen as method of assessment, this may be changed and assessment may instead take the form of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is changed, the lecturer must inform students about this by four weeks prior to the original examination date at the latest.

Language of assessment: German and/or English

Allocation of places
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Additional information
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Referred to in LPO I (examination regulations for teaching-degree programmes)
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Module title | Abbreviation
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Advanced Topics in Physics | 11-CSPM-161-m01

Module coordinator | Module offered by
chairperson of examination committee | Faculty of Physics and Astronomy

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Duration | Module level |
--- | ---|
1 semester | graduate |

Contents
This module will enable lecturers of Physics to teach advanced courses on topics not covered in any of the other modules. These topics may relate either to recent research developments or to subjects not included in the regular curriculum.

Intended learning outcomes
The students advance their knowledge and understanding of an advanced topic of nanostructure technology and acquire insights into the connections between research and teaching.

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

\[ V(3) + R(1) \]

Method of assessment
(type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

- Written examination (approx. 90 to 120 minutes) or oral examination of one candidate each (approx. 30 minutes) or oral examination in groups (groups of 2, approx. 30 minutes per candidate) or project report (approx. 8 to 10 pages) or presentation/talk (approx. 30 minutes).
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Language of assessment: German and/or English

Allocation of places
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Additional information
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**Contents**

This module allows lecturers of the quantum technology study programme to give lectures on advanced topics that can not be covered by any other module. These lectures may either reflect new developments in research or deal with topics that are not included in the regular teaching cycle.

**Intended learning outcomes**

The students deepen their knowledge and understanding of an advanced topic in quantum technology, thereby gaining insights into the interface between research and teaching.

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

V (3) + R (1)

Module taught in: German or English

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

written examination (approx. 90 to 120 minutes) or
oral examination of one candidate each (approx. 30 minutes) or
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Language of assessment: German and/or English

**Allocation of places**

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**Additional information**

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

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Winter Term 2022
(0 ECTS credits)
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Module coordinator: chairperson of examination committee

Module offered by: Faculty of Physics and Astronomy

ECTS: 6

Method of grading: Only after succ. compl. of module(s)

Method of grading: numerical grade

Duration: 1 semester

Module level: graduate

Other prerequisites: Approval from examination committee required.

Contents:

Current topics in experimental or theoretical physics. Credited academic achievements, e.g. in case of change of university or study abroad.

Intended learning outcomes:

The students have advanced competencies corresponding to the requirements of a module of Experimental or Theoretical Physics of the Master's programme of Nanostructure Technology. They have knowledge of a current subdiscipline of Physics and understand the measuring and/or calculation methods necessary to acquire this knowledge. They are able to classify the subject-specific contexts and know the application areas.

Courses:

V (3) + R (1)

Method of assessment:

a) written examination (approx. 90 to 120 minutes) or b) oral examination of one candidate each (approx. 30 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes per candidate) or d) project report (approx. 8 to 10 pages) or e) presentation/talk (approx. 30 minutes).

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Language of assessment: German and/or English

Allocation of places:

Additional information:

Referred to in LPO I (examination regulations for teaching-degree programmes)
## Module Catalogue for the Module studies (Master)

### Quantum Technology

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### Module coordinator
- chairperson of examination committee

### Module offered by
- Faculty of Physics and Astronomy

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### Duration
- 1 semester

### Module level
- graduate

### Contents
Current topics in Experimental or Theoretical Physics. Credited academic achievements, e.g. in case of change of university or study abroad.

### Intended learning outcomes
The students have advanced competencies corresponding to the requirements of a module of Experimental or Theoretical Physics of the Master's programme of Nanostructure Technology. They have knowledge of a current subdiscipline of Physics and understand the measuring and/or calculation methods necessary to acquire this knowledge. They are able to classify the subject-specific contexts and know the application areas.

### Courses
- \( V (3) + R (1) \)

### Method of assessment
a) written examination (approx. 90 to 120 minutes) or b) oral examination of one candidate each (approx. 30 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes per candidate) or d) project report (approx. 8 to 10 pages) or e) presentation/talk (approx. 30 minutes).

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Language of assessment: German and/or English

### Allocation of places
- 

### Additional information
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### Referred to in LPO I
(examination regulations for teaching-degree programmes)
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Current Topics in Physik

Abbreviation: 11-EXP5-161-m01

Module coordinator: chairperson of examination committee

Module offered by: Faculty of Physics and Astronomy

ECTS: 5

Method of grading: numerical grade

Duration: 1 semester

Module level: graduate

Other prerequisites: Approval from examination committee required.

Contents:
Current topics in Experimental or Theoretical Physics. Credited academic achievements, e.g. in case of change of university or study abroad.

Intended learning outcomes:
The students have advanced competencies corresponding to the requirements of a module of Experimental or Theoretical Physics of the Master's programme of Nanostructure Technology. They have knowledge of a current subdiscipline of Physics and understand the measuring and/or calculation methods necessary to acquire this knowledge. They are able to classify the subject-specific contexts and know the application areas.

Courses:
V (2) + R (2)

Method of assessment:
written examination (approx. 90 to 120 minutes) or oral examination of one candidate each (approx. 30 minutes) or oral examination in groups (groups of 2, approx. 30 minutes per candidate) or project report (approx. 8 to 10 pages) or presentation/talk (approx. 30 minutes).

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Language of assessment: German and/or English

Allocation of places:
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Additional information:
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**Contents**

Current topics of Experimental and Theoretical Physics. Accredited academic achievements, e.g. in case of change of university or study abroad.

**Intended learning outcomes**

The students have advanced competencies corresponding to the requirements of a module of Experimental or Theoretical Physics of the Master's programme of Nanostructure Technology. They have knowledge of a current subdiscipline of Physics and understand the measuring and/or calculation methods necessary to acquire this knowledge. They are able to classify the subject-specific contexts and know the application areas.

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

V (3) + R (1)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

| written examination (approx. 90 to 120 minutes) or oral examination of one candidate each (approx. 30 minutes) or oral examination in groups (groups of 2, approx. 30 minutes per candidate) or project report (approx. 8 to 10 pages) or presentation/talk (approx. 30 minutes). If a written examination was chosen as method of assessment, this may be changed and assessment may instead take the form of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is changed, the lecturer must inform students about this by four weeks prior to the original examination date at the latest. Language of assessment: German and/or English |

**Allocation of places**

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**Additional information**

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

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**Module title**  
Current Topics in Physik

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**Module coordinator**  
chairperson of examination committee

**Module offered by**  
Faculty of Physics and Astronomy

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**Duration**  
1 semester

**Module level**  
graduate

**Other prerequisites**  
Approval from examination committee required.

**Contents**  
Current topics of Experimental and Theoretical Physics. Accredited academic achievements, e.g. in case of change of university or study abroad.

**Intended learning outcomes**  
The students have advanced competencies corresponding to the requirements of a module of Experimental or Theoretical Physics of the Master's programme of Nanostructure Technology. They have knowledge of a current subdiscipline of Physics and understand the measuring and/or calculation methods necessary to acquire this knowledge. They are able to classify the subject-specific contexts and know the application areas.

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

V (4) + R (2)

**Method of assessment**  
(type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

written examination (approx. 90 to 120 minutes) or oral examination of one candidate each (approx. 30 minutes) or oral examination in groups (groups of 2, approx. 30 minutes per candidate) or project report (approx. 8 to 10 pages) or presentation/talk (approx. 30 minutes).

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Language of assessment: German and/or English

**Allocation of places**  
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**Additional information**  
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**Referred to in LPO I**  
(examination regulations for teaching-degree programmes)

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Module title | Abbreviation
--- | ---
Current Topics in Quantum Technology | 11-EXN5-212-m01

Module coordinator | Module offered by
chairperson of examination committee | 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 | graduate | Approval from examination committee required.

Contents
Current topics in experimental or theoretical physics. Credited academic achievements, e.g. in case of change of university or study abroad.

Intended learning outcomes
The student possesses advanced knowledge meeting the requirements of a module in theoretical or experimental physics on Master's level in the study programme Quantum Technology. He/She commands knowledge in a current field in physics and insight into the measuring and calculating methods which are necessary to acquire this knowledge. He/She is able to classify and to link the learnt. He/She knows about fields of application.

Courses (type, number of weekly contact hours, language — if other than German)
V (2) + R (2)
Module taught in: German or English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)
written examination (approx. 90 to 120 minutes) or
oral examination of one candidate each (approx. 30 minutes) or
oral examination in groups (groups of 2, approx. 30 minutes per candidate) or
project report (approx. 8 to 10 pages) or
presentation/talk (approx. 30 minutes).
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Language of assessment: German and/or English

Allocation of places
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Additional information
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**Module coordinator**  
chairperson of examination committee

**Module offered by**  
Faculty of Physics and Astronomy

### ECTS  
6

### Method of grading
Only after succ. compl. of module(s)

### Duration
1 semester

### Module level
graduate

### Other prerequisites
Approval from examination committee required.

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### Contents
Current topics in experimental or theoretical physics. Credited academic achievements, e.g. in case of change of university or study abroad.

### Intended learning outcomes
The student possesses advanced knowledge meeting the requirements of a module in theoretical or experimental physics on Master's level in the study programme Quantum Technology. He/She commands knowledge in a current field in physics and insight into the measuring and calculating methods which are necessary to acquire this knowledge. He/She is able to classify and to link the learnt. He/She knows about fields of application.

### Courses
(V (3) + R (1))  
Module taught in: German or English

### Method of assessment
(type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

- written examination (approx. 90 to 120 minutes) or
- oral examination of one candidate each (approx. 30 minutes) or
- oral examination in groups (groups of 2, approx. 30 minutes per candidate) or
- project report (approx. 8 to 10 pages) or
- presentation/talk (approx. 30 minutes).

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Language of assessment: German and/or English

### Allocation of places
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### Additional information
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### Referred to in LPO I
(examination regulations for teaching-degree programmes)

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Module title: Current Topics in Quantum Technology
Abbreviation: 11-EXN7-212-m01

Module coordinator: chairperson of examination committee
Module offered by: Faculty of Physics and Astronomy

ECTS: 7
Method of grading: numerical grade
Duration: 1 semester
Module level: graduate
Other prerequisites: Approval from examination committee required.

Contents:
Current topics in experimental or theoretical physics. Credited academic achievements, e.g. in case of change of university or study abroad.

Intended learning outcomes:
The student possesses advanced knowledge meeting the requirements of a module in theoretical or experimental physics on Master's level in the study programme Quantum Technology. He/She commands knowledge in a current field in physics and insight into the measuring and calculating methods which are necessary to acquire this knowledge. He/She is able to classify and to link the learnt. He/She knows about fields of application.

Courses:
V (3) + R (1)
Module taught in: German or English

Method of assessment:
written examination (approx. 90 to 120 minutes) or
oral examination of one candidate each (approx. 30 minutes) or
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Language of assessment: German and/or English

Allocation of places:
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Additional information:
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**Contents**

Current topics in experimental or theoretical physics. Credited academic achievements, e.g. in case of change of university or study abroad.

**Intended learning outcomes**

The student possesses advanced knowledge meeting the requirements of a module in theoretical or experimental physics on Master's level in the study programme Quantum Technology. He/She commands knowledge in a current field in physics and insight into the measuring and calculating methods which are necessary to acquire this knowledge. He/She is able to classify and to link the learnt. He/She knows about fields of application.

**Courses**

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

V (4) + R (2)

Module taught in: German or English

**Method of assessment**

(type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

written examination (approx. 90 to 120 minutes) or
oral examination of one candidate each (approx. 30 minutes) or
oral examination in groups (groups of 2, approx. 30 minutes per candidate) or
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Language of assessment: German and/or English

**Allocation of places**

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**Additional information**

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**Referred to in LPO I**

(examination regulations for teaching-degree programmes)

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**Module title**  
Current Topics in Quantum Technology

**Abbreviation**  
11-EXN6A-212-m01

**Module coordinator**  
chairperson of examination committee

**Module offered by**  
Faculty of Physics and Astronomy

**ECTS**  
6

**Method of grading**  
numerical grade

**Duration**  
1 semester

**Module level**  
graduate

**Other prerequisites**  
Approval from examination committee required.

### Contents

Current topics in experimental or theoretical physics. Credited academic achievements, e.g. in case of change of university or study abroad.

### Intended learning outcomes

The student possesses advanced knowledge meeting the requirements of a module in theoretical or experimental physics on Master's level in the study programme Quantum Technology. He/She commands knowledge in a current field in physics and insight into the measuring and calculating methods which are necessary to acquire this knowledge. He/She is able to classify and to link the learnt. He/She knows about fields of application.

### Courses

V (3) + R (1)

Module taught in: German or English

### Method of assessment

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- oral examination of one candidate each (approx. 30 minutes) or
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Language of assessment: German and/or English

### Allocation of places

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### Additional information

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### Referred to in LPO I

(examination regulations for teaching-degree programmes)

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Module title

Advanced Topics in Solid State Physics

Abbreviation

11-CSFM-161-m01

Module coordinator

Managing Director of the Institute of Theoretical Physics and Astrophysics

Module offered by

Faculty of Physics and Astronomy

ECTS

6

Method of grading

numerical grade

Only after succ. compl. of module(s)

Duration

1 semester

Module level

graduate

Other prerequisites

Approval from examination committee required.

Contents

This module will enable the lecturers of Condensed Matter Physics to teach advanced courses on topics not covered in any of the other modules. These topics may relate either to recent research developments or to subjects not included in the regular curriculum.

Intended learning outcomes

The students advance their knowledge and understanding of an advanced topic of Condensed Matter Physics and acquire insights into the connections between research and teaching.

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

V (3) + R (1)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

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Language of assessment: German and/or English

Allocation of places

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Additional information

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

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### Module title

**Advanced Topics in Physics**

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### Module coordinator

Chairperson of examination committee

### Module offered by

Faculty of Physics and Astronomy

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<tr>
<td>6</td>
<td>numerical grade</td>
<td>--</td>
</tr>
</tbody>
</table>

### Duration

1 semester

<table>
<thead>
<tr>
<th>Module level</th>
<th>Other prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>graduate</td>
<td>Approval from examination committee required.</td>
</tr>
</tbody>
</table>

### Contents

This module will enable lecturers of Physics to teach advanced courses on topics not covered in any of the other modules. These topics may relate either to recent research developments or to subjects not included in the regular curriculum.

### Intended learning outcomes

The students advance their knowledge and understanding of an advanced topic of nanostructure technology and acquire insights into the connections between research and teaching.

### Courses

<table>
<thead>
<tr>
<th>type</th>
<th>number of weekly contact hours, language — if other than German</th>
</tr>
</thead>
<tbody>
<tr>
<td>V</td>
<td>(3) + R (1)</td>
</tr>
</tbody>
</table>

### Method of assessment

Type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus

- written examination (approx. 90 to 120 minutes) or oral examination of one candidate each (approx. 30 minutes)
- or oral examination in groups (groups of 2, approx. 30 minutes per candidate) or project report (approx. 8 to 10 pages) or presentation/talk (approx. 30 minutes).

If a written examination was chosen as method of assessment, this may be changed and assessment may instead take the form of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is changed, the lecturer must inform students about this by four weeks prior to the original examination date at the latest.

Language of assessment: German and/or English

### Allocation of places

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### Additional information

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### Referred to in LPO I

(examination regulations for teaching-degree programmes)

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Module title: Advanced Topics in Quantum Technology
Abbreviation: 11-CSNM-212-m01

Module coordinator:
Managing Director of the Institute of Theoretical Physics and Astrophysics

Module offered by:
Faculty of Physics and Astronomy

ECTS: 6
Method of grading: numerical grade
Duration: 1 semester
Module level: graduate
Other prerequisites: Approval from examination committee required.

Contents:
This module allows lecturers of the quantum technology study programme to give lectures on advanced topics that cannot be covered by any other module. These lectures may either reflect new developments in research or deal with topics that are not included in the regular teaching cycle.

Intended learning outcomes:
The students deepen their knowledge and understanding of an advanced topic in quantum technology, thereby gaining insights into the interface between research and teaching.

Courses:
V (3) + R (1)
Module taught in: German or English

Method of assessment:
written examination (approx. 90 to 120 minutes) or
oral examination of one candidate each (approx. 30 minutes) or
oral examination in groups (groups of 2, approx. 30 minutes per candidate) or
project report (approx. 8 to 10 pages) or
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Language of assessment: German and/or English

Allocation of places:
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Additional information:
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Referred to in LPO I (examination regulations for teaching-degree programmes):
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