Subdivided Module Catalogue
for the Module studies (Master)

Quantum Technology

Examination regulations version: 2021
Responsible: Faculty of Physics and Astronomy
Abbreviations used

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

Term: \text{SS} = \text{summer semester}, \text{WS} = \text{winter semester}

Methods of grading: \text{NUM} = \text{numerical grade}, \text{B/NB} = \text{(not) successfully completed}

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

Other: \text{A} = \text{thesis}, \text{LV} = \text{course(s)}, \text{PL} = \text{assessment(s)}, \text{TN} = \text{participants}, \text{VL} = \text{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)):

\begin{itemize}
  \item 15-May-2019 (2019-36)
  \item 27-Jun-2019 (2019-41)
  \item 14-Nov-2019 (2019-52)
  \item 22-Jan-2020 (2020-13)
  \item 06-May-2019 (2020-39)
  \item 22-Jul-2020 (2020-57)
  \item 17-Dec-2020 (2020-110)
  \item 10-Mar-2021 (2021-17)
\end{itemize}
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

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<td>11-EXN7-212-m01</td>
<td>Current Topics in Quantum Technology</td>
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<td>11-EXN8-212-m01</td>
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<td>Advanced Topics in Solid State Physics</td>
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<td>Advanced Topics in Physics</td>
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<td>11-CSNM-212-m01</td>
<td>Advanced Topics in Quantum Technology</td>
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<td>NUM 17</td>
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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

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</table>

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

(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 can be chosen to earn a 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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**Courses** (type, number of weekly contact hours, language — if other than German)

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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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**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 can be chosen to earn a 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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Current title

Current Topics in Physik

Abbreviation

11-EXP7-161-m01

Module coordinator

Chairperson of examination committee

Module offered by

Faculty of Physics and Astronomy

ECTS

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Method of grading

Numerical grade

Only after successful completion of module(s)

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

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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 can be chosen to earn a 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**  
Current Topics in Physik

**Abbreviation**  
11-EXP8-161-m01

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**Module coordinator**  
Chairperson of examination committee

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

**ECTS**  
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**Method of grading**  
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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 can be chosen to earn a 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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Current title | Abbreviation
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Current Topics in Quantum Technology | 11-EXN5-212-m01

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

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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 can be chosen to earn a 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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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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<td>oral examination of one candidate each</td>
<td>approx. 30 minutes</td>
<td>German and/or English</td>
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<td>oral examination in groups (groups of 2)</td>
<td>approx. 30 minutes per candidate</td>
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<td>project report</td>
<td>approx. 8 to 10 pages</td>
<td>German and/or English</td>
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</tr>
<tr>
<td>presentation/talk</td>
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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: Current Topics in 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:
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Courses:
V (3) + R (1)
Module taught in: German or English

Method of assessment:
- written examination (approx. 90 to 120 minutes)
- oral examination of one candidate each (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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**Courses** (type, number of weekly contact hours, language — if other than German)

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

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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
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Current Topics in Quantum Technology | 11-EXN6A-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)
---|---|---
6 | numerical grade | --

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

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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 can be chosen to earn a 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 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)
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### 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
(Elective, number of weekly contact hours, language — if other than German)

- V (3) + R (1)

### Method of assessment
(Examination 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 to 120 minutes) or
- b) oral examination of one candidate each (approx. 30 minutes)
- c) oral examination in groups (groups of 2, approx. 30 minutes per candidate)
- d) project report (approx. 8 to 10 pages)
- 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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<td>chairperson of examination committee</td>
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<td>1 semester</td>
<td>graduate</td>
<td>Approval from examination committee required.</td>
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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 can be chosen to earn a 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

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

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### 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 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 can be chosen to earn a 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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