Annex SFB

**Studienfachbeschreibung (subject description, SFB) for the subject**

**Nanostructure Technology as a Bachelor’s with 1 major**

**with the Degree (180 ECTS credits)**

Responsible: Faculty of Physics and Astronomy

Examination regulations version: 2008

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 for the modules in this SFB:

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

Information on assessment procedures:

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 a 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:

**ASPO2007**

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

**3-Sep-2009 (2009-28)**

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.

Every module will be described using the following form:

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Module title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECTS</td>
<td>Duration</td>
</tr>
<tr>
<td>Courses</td>
<td>To be specified in the form X (y) with course type X abbreviated as specified above and number of weekly contact hours y</td>
</tr>
<tr>
<td>Method of assessment</td>
<td></td>
</tr>
<tr>
<td>Only after successful completion of</td>
<td>if applicable</td>
</tr>
<tr>
<td>Other prerequisites</td>
<td>if applicable</td>
</tr>
<tr>
<td>Participants and allocation of places</td>
<td>if applicable</td>
</tr>
<tr>
<td>Additional information</td>
<td>if applicable</td>
</tr>
<tr>
<td>Referred to in LPO I</td>
<td>if applicable (examination regulations for teaching-degree programmes)</td>
</tr>
</tbody>
</table>
### Compulsory Courses (132 ECTS credits)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>ECTS</th>
<th>Duration</th>
<th>Method of grading</th>
<th>Modul level</th>
</tr>
</thead>
<tbody>
<tr>
<td>11-N1-072-m01</td>
<td><strong>Nanostructure Technology</strong></td>
<td>6</td>
<td>1 semester</td>
<td>numerical grade</td>
<td>undergraduate</td>
</tr>
<tr>
<td></td>
<td>Basics of Nanostructure Technology</td>
<td></td>
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<tr>
<td>11-N2-082-m01</td>
<td><strong>Basic electronics with laboratory course</strong></td>
<td>6</td>
<td>1 semester</td>
<td>numerical grade</td>
<td>undergraduate</td>
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<td></td>
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</tr>
<tr>
<td>11-PFB-072-m01</td>
<td><strong>Lab Course Engineering</strong></td>
<td>4</td>
<td>1 semester</td>
<td>(not) successfully completed</td>
<td>undergraduate</td>
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<tr>
<td></td>
<td>Advanced Practical Course Bachelor</td>
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</table>

### Method of assessment

- **Nanostructure Technology**
  - V + S (no information on SWS (weekly contact hours) and course language available)
  - Method of assessment: written examination (approx. 90 minutes)

- **Basic electronics with laboratory course**
  - V + P (no information on SWS (weekly contact hours) and course language available)
  - Method of assessment: written examination (approx. 90 minutes)

- **Lab Course Engineering**
  - Method of assessment: This module has the following assessment components
    1. Seminar: talk (with discussion) demonstrating the students' understanding of the physics-related aspects of the experiments to be prepared (approx. 30 minutes)
    2. Lab course: Preparing, performing and evaluating the experiments will be considered successfully completed if a Testat (exam) is passed. Students must prepare an experiment log (8 to 10 pages).

Modules successfully completed: 11-E1, 11-E2

Other prerequisites: 11-A3
<table>
<thead>
<tr>
<th>Module ID</th>
<th>Advanced Undergraduate Laboratory (Classical Mechanics, Thermodynamics, Basic Circuitry)</th>
<th>Advanced Undergraduate Laboratory (Optics, Basic Semiconductor Circuits)</th>
<th>Industrial Internship</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECTS</td>
<td>4</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>Duration</td>
<td>1 semester</td>
<td>1 semester</td>
<td>1 semester</td>
</tr>
<tr>
<td>Method of grading</td>
<td>(not) successfully completed</td>
<td>(not) successfully completed</td>
<td>(not) successfully completed</td>
</tr>
<tr>
<td>Modul level</td>
<td>undergraduate</td>
<td>undergraduate</td>
<td>undergraduate</td>
</tr>
<tr>
<td>Courses</td>
<td>Beispiele aus Mechanik, Wärmelehre und Elektrik (Examples from Mechanics, Thermodynamics and Electricity, BAM): P (2 weekly contact hours) Klassische Physik (Classical Physics, KLP): P (2 weekly contact hours) Elektrizitätslehre und Schaltungen (Electricity and Circuits, ELS): P (2 weekly contact hours)</td>
<td>Wellenoptik (Physical Optics, WOP): P (2 weekly contact hours) Atom- und Kernphysik (Atomic and Nuclear Physics, AKP): P (2 weekly contact hours) Computer und Messtechnik (Computers and Measurement Technology, CMT): P (2 weekly contact hours)</td>
<td></td>
</tr>
<tr>
<td>Method of assessment</td>
<td>This module has the following assessment components</td>
<td>This module has the following assessment components</td>
<td>Placement report / fieldwork report / report on practical training / report on practical course / project report / report on technical course (20 pages)</td>
</tr>
<tr>
<td></td>
<td>1. Lab course in part 1: a) Preparing, performing and evaluating the experiments will be considered successfully completed if a Testat (exam) is passed. b) Talk (with discussion) to test the students' understanding of the physics-related contents of the course (approx. 30 minutes). 2. Lab course in part 2: a) Preparing, performing and evaluating the experiments will be considered successfully completed if a Testat (exam) is passed. b) Talk (with discussion) to test the students' understanding of the physics-related contents of the course (approx. 30 minutes). Students must register for assessment components 1 and 2 online (registration deadline to be announced). Students will be offered one opportunity to retake element a) and/or element b). To pass an assessment component, they must pass both elements a) and b). To pass this module, students must successfully complete two out of the three courses. To pass this module, students must pass both assessment component 1 and assessment component 2.</td>
<td></td>
<td>placement report / fieldwork report / report on practical training / report on practical course / project report / report on technical course (20 pages)</td>
</tr>
<tr>
<td>other prerequisites</td>
<td>Recommended: 11-PFR</td>
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</table>

Bachelor's with 1 major Nanostructure Technology (2008)
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>ECTS</th>
<th>Duration</th>
<th>Method of Grading</th>
<th>Modul Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>11-MPI3-062-m01</td>
<td>Mathematics 3 for students of Physics and Engineering</td>
<td>8</td>
<td>1 semester</td>
<td>numerical grade</td>
<td>undergraduate</td>
</tr>
<tr>
<td>Courses</td>
<td>V + Ü (no information on SWS (weekly contact hours) and course language available)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Method of assessment</td>
<td>written examination (approx. 120 minutes)</td>
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<td></td>
</tr>
<tr>
<td>Other prerequisites</td>
<td>Admission prerequisite to assessment: successful completion of approx. 50% of exercises. 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.</td>
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<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>ECTS</th>
<th>Duration</th>
<th>Method of Grading</th>
<th>Modul Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-M-NST1-072-m01</td>
<td>Mathematics 1 for students in Nanostructural Engineering</td>
<td>10</td>
<td>1 semester</td>
<td>numerical grade</td>
<td>undergraduate</td>
</tr>
<tr>
<td>Courses</td>
<td>V + Ü (no information on SWS (weekly contact hours) and course language available)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Method of assessment</td>
<td>written examination (90 minutes)</td>
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</table>

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>ECTS</th>
<th>Duration</th>
<th>Method of Grading</th>
<th>Modul Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-M-NST2-072-m01</td>
<td>Mathematics 2 for students in Nanostructural Engineering</td>
<td>8</td>
<td>1 semester</td>
<td>numerical grade</td>
<td>undergraduate</td>
</tr>
<tr>
<td>Courses</td>
<td>V + Ü (no information on SWS (weekly contact hours) and course language available)</td>
<td></td>
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</tr>
<tr>
<td>Method of assessment</td>
<td>written examination (90 minutes)</td>
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</table>
### Chemistry (10 ECTS credits)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>ECTS</th>
<th>Duration</th>
<th>Method of grading</th>
<th>Modul level</th>
</tr>
</thead>
<tbody>
<tr>
<td>08-CP1-072-m01</td>
<td>General Chemistry for Physics and Engineers</td>
<td>10</td>
<td>1 semester</td>
<td>numerical grade</td>
<td>undergraduate</td>
</tr>
</tbody>
</table>

#### Courses

This module comprises 3 module components. Information on courses will be listed separately for each module component.

- 08-IOC-1-072: V (no information on SWS (weekly contact hours) and course language available)
- 08-CP1-1-072: V (no information on SWS (weekly contact hours) and course language available)
- 08-CP1-3-072: P (no information on SWS (weekly contact hours) and course language available)

#### Method of assessment

Assessment in this module comprises the assessments in the individual module components as specified below. Unless stated otherwise, successful completion of the module will require successful completion of all individual assessments.

- **Assessment in module component 08-IOC-1-072:** Organic Chemistry for students of medicine, biomedicine, dental medicine, engineering and natural science
  - 3 ECTS, Method of grading: numerical grade
  - written examination (approx. 60 minutes)

- **Assessment in module component 08-CP1-1-072:** Basics of General an Inorganic Chemistry
  - 5 ECTS, Method of grading: numerical grade
  - written examination (60 minutes)

- **Assessment in module component 08-CP1-3-072:** General and Analytical Chemistry (lab)
  - 2 ECTS, Method of grading: (not) successfully completed
  - for each experiment: Vortestate (pre-experiment exams, approx. 10 minutes each), assessment of practical performance (log, 2 to 5 pages), Nachtestate (post-experiment exams, approx. 10 minutes each)
  - Assessment offered: once a year, summer semester
  - Only after successful completion of module components: Successful completion of module component 08-CP1-1 is a prerequisite for participation in module component 08-CP1-3.

### Experimental Physics (42 ECTS credits)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>ECTS</th>
<th>Duration</th>
<th>Method of grading</th>
<th>Modul level</th>
</tr>
</thead>
<tbody>
<tr>
<td>11-E1-072-m01</td>
<td>Experimental Physics 1 (Mechanics, Thermodynamics, Waves and Oscillations)</td>
<td>8</td>
<td>1 semester</td>
<td>numerical grade</td>
<td>undergraduate</td>
</tr>
</tbody>
</table>

#### Courses

V + Ü (no information on SWS (weekly contact hours) and course language available)

#### Method of assessment

written examination (approx. 120 minutes)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>ECTS</th>
<th>Duration</th>
<th>Method of grading</th>
<th>Modul level</th>
</tr>
</thead>
<tbody>
<tr>
<td>11-E2-072-m01</td>
<td>Experimental Physics 2 (Electrics and Magnetism)</td>
<td>8</td>
<td>1 semester</td>
<td>numerical grade</td>
<td>undergraduate</td>
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</table>

#### Courses

V + Ü (no information on SWS (weekly contact hours) and course language available)

#### Method of assessment

written examination (approx. 120 minutes)

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<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>ECTS</th>
<th>Duration</th>
<th>Method of grading</th>
<th>Modul level</th>
</tr>
</thead>
<tbody>
<tr>
<td>11-E3-072-m01</td>
<td>Experimental Physics 3 (Optics, Quantum Phenomena, Introduction Atomic Physics)</td>
<td>8</td>
<td>1 semester</td>
<td>numerical grade</td>
<td>undergraduate</td>
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</tbody>
</table>

#### Courses

V + Ü (no information on SWS (weekly contact hours) and course language available)

#### Method of assessment

written examination (approx. 120 minutes)
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>ECTS</th>
<th>Duration</th>
<th>Method of Grading</th>
<th>Modul Level</th>
<th>Course Language Available</th>
</tr>
</thead>
<tbody>
<tr>
<td>11-E7-072-m01</td>
<td>Experimental Physics 7 (Solid State Phenomena)</td>
<td>4</td>
<td>1 semester</td>
<td>numerical grade</td>
<td>undergraduate</td>
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<tr>
<td></td>
<td>(Semiconductor, Superconductivity, Magnetism)</td>
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<td></td>
<td>Courses</td>
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<td>V + Ü</td>
<td>(no information on SWS</td>
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<td></td>
<td>Method of assessment</td>
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<td>(weekly contact hours) and course language available</td>
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<tr>
<td>11-E5-082-m01</td>
<td>Experimental Physics 5 (Introduction to Solid</td>
<td>8</td>
<td>1 semester</td>
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<td>V + Ü</td>
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<td>(weekly contact hours) and course language available</td>
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<tr>
<td>11-E4-082-m01</td>
<td>Experimental Physics 4 (Physics of Atoms and</td>
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<td>1 semester</td>
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<tr>
<td></td>
<td>Molecules)</td>
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<td>Courses</td>
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<td>V + Ü</td>
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<tr>
<td></td>
<td>Method of assessment</td>
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<td>(weekly contact hours) and course language available</td>
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<td>Theoretical Physics (16 ECTS credits)</td>
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<tr>
<td>11-T1-072-m01</td>
<td>Theoretical Physics 1 (Theoretical Mechanics)</td>
<td>8</td>
<td>1 semester</td>
<td>numerical grade</td>
<td>undergraduate</td>
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<tr>
<td></td>
<td>Courses</td>
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<td>V + Ü</td>
<td>(no information on SWS</td>
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<td></td>
<td>Method of assessment</td>
<td></td>
<td>(weekly contact hours) and course language available</td>
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<tr>
<td>11-T3-072-m01</td>
<td>Theoretical Physics 3 (Theoretical Quantum</td>
<td>8</td>
<td>1 semester</td>
<td>numerical grade</td>
<td>undergraduate</td>
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<td></td>
<td>Mechanics)</td>
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<td>V + Ü</td>
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<td>Method of assessment</td>
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<td>(weekly contact hours) and course language available</td>
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<td>11-T3F-072-m01</td>
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<td>Courses</td>
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<td>V + Ü</td>
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<td>(weekly contact hours) and course language available</td>
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<tr>
<td></td>
<td>Module Comprehensive Tests (8 ECTS credits)</td>
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<tr>
<td>11-PREN-072-m01</td>
<td>Comprehensive Exam in Theoretical Physics /</td>
<td>4</td>
<td>1 semester</td>
<td>numerical grade</td>
<td>undergraduate</td>
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<tr>
<td></td>
<td>Nanostructure Technology</td>
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<td></td>
<td>Courses</td>
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<td></td>
<td>Method of assessment</td>
<td></td>
<td>(weekly contact hours) and course language available</td>
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<tr>
<td>11-PRN-072-m01</td>
<td>Comprehensive Exam in Theoretical Physics /</td>
<td>4</td>
<td>1 semester</td>
<td>numerical grade</td>
<td>undergraduate</td>
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<td>Nanostructure Technology</td>
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<td>A</td>
<td>(no information on SWS</td>
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<tr>
<td>Code</td>
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<td>Method of grading</td>
<td>Grade</td>
<td>Modul level</td>
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<td>-----------------------------------------------------------------------</td>
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<tr>
<td>08-NM-AW-072-m01</td>
<td>Nanomatrix Inorganic Materials Chemistry</td>
<td>6</td>
<td>1 semester</td>
<td>numerical grade</td>
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<tr>
<td>08-NM-NS-072-m01</td>
<td>Nanoparticle Synthesis and Structuring Technologies</td>
<td>6</td>
<td>1 semester</td>
<td>numerical grade</td>
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<td>undergraduate</td>
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<td>11-NM-WP-072-m01</td>
<td>Nanomatrix insulation systems and photovoltaics</td>
<td>6</td>
<td>1 semester</td>
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<tr>
<td>11-NM-HM-072-m01</td>
<td>Nanomatrix semiconductor materials</td>
<td>6</td>
<td>1 semester</td>
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<td>11-NM-HP-072-m01</td>
<td>Nanomatrix Semiconductor Processing</td>
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<tr>
<td>11-NM-MB-072-m01</td>
<td>Principles Micro/Nano- and Optoelectronic Devices</td>
<td>6</td>
<td>1 semester</td>
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<td>03-NM-BW-072-m01</td>
<td>Nanomatrix Biomedical Materials</td>
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<td>Duration</td>
<td>Method of grading</td>
<td>Modul level</td>
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<td>07-NM-BS-072-m01</td>
<td>Nanomatrix Biocompatible Structuring Technologies</td>
<td>6</td>
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<td>Courses</td>
<td>V + R (no information on SWS (weekly contact hours) and course language available)</td>
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<tr>
<td>Method of assessment</td>
<td>a) written examination (approx. 90 minutes) or b) talk (approx. 30 minutes) or c) oral examination of one candidate each or oral examination in groups (approx. 30 minutes) or d) project report (approx. 10 pages)</td>
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<th>ECTS</th>
<th>Duration</th>
<th>Method of grading</th>
<th>Modul level</th>
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<tbody>
<tr>
<td>11-NM-BV-072-m01</td>
<td>Nanomatrix Biophysical Analyzing Systems and Processes</td>
<td>6</td>
<td>1 semester</td>
<td>numerical grade</td>
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### Thesis (10 ECTS credits)

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<th>Modul level</th>
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<tbody>
<tr>
<td>11-BA-N-072-m01</td>
<td>Bachelor Thesis Nanostructure Technology</td>
<td>10</td>
<td>1 semester</td>
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<td>Courses</td>
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### Subject-specific Key Skills (14 ECTS credits)

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<tbody>
<tr>
<td>11-T2-072-m01</td>
<td>Theoretical Physics 2 (Theoretical Electrostatics and Electrodynamics)</td>
<td>8</td>
<td>1 semester</td>
<td>numerical grade</td>
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<tr>
<td>Method of assessment</td>
<td>written examination (approx. 120 minutes)</td>
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<tbody>
<tr>
<td>11-T4-072-m01</td>
<td>Theoretical Physics 4 (Theoretical Thermodynamics and Statistics)</td>
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<td>Method of assessment</td>
<td>written examination (approx. 120 minutes)</td>
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<th>Duration</th>
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<th>Modul level</th>
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<tbody>
<tr>
<td>11-MPI4-062-m01</td>
<td>Mathematics 4 for Students of Physics and Engineering</td>
<td>8</td>
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<td>Method of assessment</td>
<td>written examination (approx. 120 minutes)</td>
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<th>Duration</th>
<th>Method of grading</th>
<th>Modul level</th>
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<tbody>
<tr>
<td>11-PFR-072-m01</td>
<td>Measurements and Data Analysis</td>
<td>2</td>
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<tr>
<td>Method of assessment</td>
<td>written examination (approx. 120 minutes)</td>
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<tr>
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<th>Duration</th>
<th>Method of grading</th>
<th>Modul level</th>
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<tbody>
<tr>
<td>11-A1-072-m01</td>
<td>Computational Physics</td>
<td>6</td>
<td>1 semester</td>
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<tr>
<td>Method of assessment</td>
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<td>11-A3-072-m01</td>
<td>Laboratory and Measurement Technology</td>
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<td></td>
<td>Method of assessment</td>
<td>written examination (approx. 120 minutes)</td>
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<tr>
<td></td>
<td>other prerequisites</td>
<td>Admission prerequisite to assessment: successful completion of approx. 50% of exercises. 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.</td>
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<tr>
<td></td>
<td>Participants and allocation of places</td>
<td>Only as part of pool of general key skills (ASQ): 15 places. Places will be allocated by lot.</td>
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<td>11-MKS-082-m01</td>
<td>Introduction Course Mathematics</td>
<td>3</td>
<td>1 semester</td>
<td>(not) successfully completed</td>
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<td>Method of assessment</td>
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