Course Specifications
Valid as from the academic year 2014-2015

Physics and Chemistry of Nanostructured Materials (E024720)

Course size

<table>
<thead>
<tr>
<th>Credits</th>
<th>Study time</th>
<th>Contact hrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.0</td>
<td>180 h</td>
<td>52.5 h</td>
</tr>
</tbody>
</table>

Course offerings and teaching methods in academic year 2016-2017

A (semester 1)
- lecture: 30.0 h
- seminar: coached exercises 15.0 h

Lecturers in academic year 2016-2017

- Hens, Zeger WE06 lecturer-in-charge
- Brainis, Edouard WE06 co-lecturer

Offered in the following programmes in 2016-2017

<table>
<thead>
<tr>
<th>Programme</th>
<th>crdts</th>
<th>offering</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master of Science in Biomedical Engineering</td>
<td>6</td>
<td>A</td>
</tr>
<tr>
<td>International Master of Science in Biomedical Engineering</td>
<td>6</td>
<td>A</td>
</tr>
<tr>
<td>Master of Science in Biomedical Engineering</td>
<td>6</td>
<td>A</td>
</tr>
<tr>
<td>Master of Science in Engineering Physics</td>
<td>6</td>
<td>A</td>
</tr>
</tbody>
</table>

Teaching languages

English

Keywords

nanoscience, colloidal nanocrystals, quantum confinement, self-assembly, quantum transport

Position of the course

The course will give students an introduction in the chemical and physical background of nanosciences. The course focuses on the (physico)chemical principles used to make nano-objects and on the physical properties of these objects. The aim of the course is that students understand what nanoscience is, that students have insight in the course of actual nanoscience research and the students can situate and interpret scientific literature on nanoscience.

Contents

- Introduction: Nanoscience and nanotechnology: what, why and how?, Observation, measurement and manipulation at the nanoscale
- Building blocks of bottom-up nanotechnology: Synthesis of colloidal nanocrystals, Quantum confinement in semiconductor nanocrystals, Magnetic nanostructures, Carbon nanotubes

Initial competences

physics 1, physics 2, chemistry 1, chemistry 2, Physical chemistry, quantum mechanics 1, quantum mechanics 2, solid-state physics 1, solid-state physics 2

Final competences

Conditions for credit contract

Access to this course unit via a credit contract is determined after successful competences assessment

Conditions for exam contract

(Approved)
This course unit cannot be taken via an exam contract

**Teaching methods**
Lecture, seminar: coached exercises

**Extra information on the teaching methods**
Classroom lectures; Classroom problem solving sessions; Classroom lectures

**Learning materials and price**
The course is using recent review papers from the literature.
Price for copies: 7.5 euro

**References**

**Course content-related study coaching**

**Evaluation methods**
continuous assessment

**Examination methods in case of periodic evaluation during the first examination period**

**Examination methods in case of periodic evaluation during the second examination period**

**Examination methods in case of permanent evaluation**
Oral examination, report

**Possibilities of retake in case of permanent evaluation**
examination during the second examination period is possible in modified form

**Extra information on the examination methods**
During semester: graded project reports; graded oral presentation. Second chance:
Possible in adapted form

**Calculation of the examination mark**
Evaluation throughout semester

(Approved)