Physics and Chemistry of Nanostructured Materials (E024720)

Course Specifications
Valid as from the academic year 2014-2015

Lecturers in academic year 2016-2017
Hens, Zeger
Brainis, Edouard

Course offerings and teaching methods in academic year 2016-2017
A (semester 1)
lecture 30.0 h
seminar: coached exercises 15.0 h

Offered in the following programmes in 2016-2017
Master of Science in Biomedical Engineering 6 A
International Master of Science in Biomedical Engineering 6 A
Master of Science in Biomedical Engineering 6 A
Master of Science in Engineering Physics 6 A

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**
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**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