MASTER IN NANOSCIENCE AND NANOTECHNOLOGY

European official Master (EEES)

Universitat de Barcelona
Universitat Rovira i Virgili
Universitat Politècnica de Catalunya
Universitat de Girona

nanotec@ub.edu

Objectives

Formation at post-graduate level of researchers and professionals able to answer to the new challenges related to the scientific and technological developments of interdisciplinary research domains in nanoscience and nanotechnology.

Institutions Involved

The Master constitutes an ambitious interuniversitary action that involves Lecturers, Professors and Researchers from groups with a significant activity in the fields of Nanoscience and Nanotechnology. This involves four of the main Universities in Catalonia (including two of the main Research and Technological Universities in Spain, located in Barcelona) and research institutes in the area of Barcelona, most of them integrated in the Spanish Superior Research Council (CSIC), under the coordination of the University of Barcelona:

- University of Barcelona (Coordinator)
- University Rovira i Virgili (URV)
- Polytechnical University of Catalonia
- University of Girona
- Catalan Institute in Chemical Research (ICIQ)
- Barcelona Institute of Microelectronics (IMB-CNM-CSIC)
- Barcelona Institute of Material Sciences (ICMAB-CSIC)

This ambitious consortium of Universities and Research Institutes involves a wide ensemble of research groups with a significant activity at international level in different aspects related to Nanoscience and Nanotechnology, including Biomedicine, Pharmacy, Physical and Chemical Sciences, Materials Science and Technology, Energy and Information Society Technologies.

Location

The main body of the Master is simultaneously offered in two main University locations, which allows students to select the main location for their lectures:

- University area (“Campus Sud-Pedralbes) in the city of Barcelona
- University Campus of Tarragona (URV)

Admission

The Master is addressed to students with a University degree in science and/or engineering disciplines thematically involved in Nanoscience and Nanotechnology (Physics, Chemistry, Biology, Medicine, Pharmaceutical Sciences, Materials Science and Engineering, Electronics Engineering,.....), wanting to obtain an interdisciplinary postgraduate formation in Nanoscience and Nanotechnology.

Candidates wanting to join the Master have to contact the Admission Committee, through the e-mail address nanotec@ub.edu

Duration

The duration of the Master is variable (60 – 120 ECTS) depending on the previous studies of the candidates. For students with a university level equivalent to the Spanish “Licenciatura” (≥ 240 ECTS), a 60 ECTS path is proposed that includes different kinds of itineraries according to the curriculum profile of the candidate.
Price

The Master is included in the Spanish official public university system. According to this, a significant percentage of costs is funded by public Spanish institutions.

Dates

Pre-inscription will be open in early June. The course will be organised in two terms:
- Fall term: September 2006 to January 2007
- Spring term: February to June 2007

Tutorial Actions Plan

Each student will have a tutor. The tutor will guide the student in the election of the matters and topics best suited to his capabilities and formation, and will evaluate the consecution of transversal competences and abilities.

Competences Profile

The Master has a polyvalent character, which includes both research and professional profiles, giving formation in competences centred in:

i) Fundamental aspects, state of the art and scientific and technological advances in Nanoscience and Nanotechnology

ii) New tools and techniques for manufacturing, nanomanipulation and characterisation of nanostructured materials, devices and systems. These are needed for the development, coordination and planning of R+D activities in new nanostructured materials, nanodevices and nanosystems for different kinds of applications (Biotechnology, Biomedicine, Pharmacy, Information Society Technologies….)

The Master includes also aspects related to professional competences that are required for the formation of high level professionals (researchers, technicians) for the industrial world.

Topics (60 ECTS profiles)

Students have to select:

i) Four topics (20 ECTS) from the following set of Fundamental 5 ECTS Matters:
- Nanotechnology (mandatory)
- Quantum Physics and Chemistry
- Effects at the Nanoscale
- Surface Science
- Supra and Macromolecular Chemistry
- Biochemistry at the Nanoscale
- Nanobiotechnology
- Nanomanufacturing and nanoprocessing: the top down approach
- Biodisponibility and therapeutic efficiency

ii) Four topics (10 ECTS) from 2.5 ECTS optional matters included in Transversal modules (Technology and Characterisation tools) and Specialisation modules (Chemistry of Nanosystems, Nanobiomedicine and Nanobiotherapy, Information Society Technologies, Energy and Environmental Control)

Master Thesis: Practical Work

All students will perform a 30 ECTS practical work (equivalent to the Master thesis). This will be developed during both lecture terms, under the supervision of the Tutor. Two different work profiles are considered:

a) Research project. This will allow to initiate the student in research activities, in the framework of an active research group competitive at international level

b) Innovative industrial project.

Research: Doctoral Thesis

This Master degree allows for the realisation of a Doctoral Thesis (PhD) in one of the University research groups involved in the Master Consortium. Doctorate studies can be developed in one of the following research lines:

- Modelling and simulation of material properties at the nanoscale
- Nanobiotechnology
- Nanopharmacotherapy
- Nanomagnetism, Nanophotonics, Nanoelectronics
- Nanostructured Materials
- Nano-energy: nanomaterials and nanodevices for energy production, storage and rational use

Contact mail’s

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