Faculté des Sciences
Aix*Marseille Université

2021 / 2022

Sciences et Technologies
Master Nanosciences et nanotechnologies

Responsables

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Descriptions

Type : Master

Domaines : Sciences et Technologies

Informations

Registration fees : 243 €

Composante : Faculty of Science

ECTS crédits : 120

AIMS

The objective of the Master is to train students graduated with a B.Sc. in Physics, Chemistry, Physics-Chemistry or Engineering Sciences to acquire skills necessary to find innovative solutions for solving complex problems related to the development of nanomaterials and nanotechnologies in various contexts (research, development, production or training).

The master's degree offers a high-level program to understand, design, elaborate and implement materials and nanomaterials in highly innovative domains such as nano-engineering, nanoelectronics, energy or health.

Two classical programs are proposed, "Nanoscale and Quantum Engineering" and "Engineering of Materials and Nanotechnologies", together with an international program – Erasmus Mundus "Chemical nano-engineering".

The master courses of the program "Engineering of Materials and Nanotechnologies » are taught in French.

The M1 courses of the "Nanoscale and Quantum Engineering" program are taught in French. The M2 courses of this program are taught in English : https://physique-sciences.univ-amu.fr/master-nanosciences-nanotechnologies/master-nanosciences-and-nanotechnologies

The program offers the choice of recruitment in industry or application for a Ph.D. degree.

TARGETED STUDENTS

Students who have acquired an efficient work method to learn science, who master the basic concepts and tools in mathematics, physics and/or chemistry and are motivated to understand and engineer matter at the nanoscale

ADMISSION CONDITIONS

Admission after examination of the applications.

M1: Bachelor of Science in Physics, Chemistry, Physics-Chemistry, Engineering Science or equivalent Bachelor's degree.

M2: 1st year of a master or a 2nd year of engineering school with skills in Physics or Chemistry of Materials.

STRUCTURE AND ORGANISATION

M2 "Nanoscale and Quantum Engineering": high-level program with several optional advanced courses. 4-month Internship in Laboratory or Industry.

"Chemical NanoEngineering": the courses take place in three universities : Aix-Marseille University (semester 1), Wrocław University of Science and Technology (semester 2) and University Roma Tor Vergata (semester 3). The fourth semester corresponds to an internship in one of the three universities.

TYPICAL COURSE LIST

- Parcours : Ingénierie des matériaux et nanotechnologies
- Chemical NanoEngineering
- Course: Nanoscale and quantum engineering
- Computer science accelerated curriculum

KNOWLEDGE TO BE ACQUIRED

This master's degree offers a high-level program in the field of Nanosciences and Nanotechnologies, based on an interdisciplinary approach combining physics, physico-chemistry of materials, chemistry, applied sciences and information technology / communication.

Graduates acquire skills focused on the characterization, fabrication and modeling of objects of the nanoworld (nanostructures, materials and nanomaterials, nanocomponents and nanodevices), which rely on knowledge in different fields such as physico-chemistry of materials, electronic and transport properties of nanostructures and nanodevices, imaging techniques and spectroscopy of nanostructures.

The teaching also includes micro- and nanofabrication techniques and their practical implementation in a clean room.

Lessons in details
Course by course, for IMN and NDQ programs:

- Semester 1: Common core (IMN & NDQ programs)
- Semester 2: Programs IMN & NDQ
- Semesters 3 & 4: Programs IMN & NDQ

PROFESSIONAL SKILLS TO BE ACQUIRED

Graduated students will be able to :

- Elaborate, characterize and model materials, from the nanoscale to the macroscopic scale.
- Implement a creative experimental approach to develop, characterize or model materials and nanomaterials with unknown properties.
- Design, develop and implement materials and nanomaterials in different professional contexts and fields of application, integrating ethical, environmental and societal challenges.
- Understand a scientific document ; write a scientific report or project and make an oral presentation of them.
- Develop a professional project to highlight their own expertise, aspirations and skills and facilitate professional adaptation and integration in a company or research laboratory.

INTERNSHIPS AND SUPERVISED PROJECTS

The training is finalized by internships in research laboratories or companies, occurring during the 2nd and 4th semesters.

FURTHER EDUCATION

Continuation with doctoral studies (public laboratory or laboratory partnership)

PARTNERS

Some enterprises linked with the Master program (internships) :

Eurocopter, Comex, EDF, Veolia, CEA, Arcelormittal, ST Microelectronics.

AMU Laboratories linked with the Master program (practical works in Lab, internships) :

IM2NP, CINaM, MADIREL, ICR, Institut Fresnel, PIIM, LP3.

SUPPORT FOR YOUR LABOR MARKET INTEGRATION

Professional courses help the student to develop a professional project to highlight his own expertise, aspirations and skills and facilitate professional adaptation and integration in a company or research laboratory.

SUPPORT FOR YOUR STUDIES ABROAD

The program "Chemical NanoEngineering" – Erasmus Mundus is shared by three partner universities : Aix-Marseille University, Wrocław University of Science and Technology and University Roma Tor Vergata.

The courses of the program "Chemical NanoEngineering" and the M2 courses of the program "Nanoscale and Quantum Engineering" are taught in English.

FURHER INFORMATION

Schedule

Master 1 - Semester 1

Click on the picture below to download the schedule in MS Word format (.docx).

FOR MORE INFORMATION

Goto university formation descriptive site...

Last modification: 26/01/2022