

# M.Sc. in Nanosciences and Nanotechnologies



Understanding and engineering matter at the nanoscale. Design, elaborate and implement materials and nanomaterials in different professional contexts, using disciplinary knowledge and tools of physics, chemistry and physico-chemistry of materials.

## Semester 1

**Common core** of knowledge in :

Materials and Nanomaterials  
Condensed matter  
Quantum physics  
Statistical physics  
Electronics - Semiconductors  
Electrochemistry  
Thermodynamics of alloys

**Requirements to access :**

B.Sc. in  
Physics  
Chemistry  
Physics - Chemistry  
Engineering Sciences

## 2 focus tracks in Semester 2, 3 and 4

### Nanoscale and Quantum Engineering

To provide skills in the advanced fields of research and development of nanosciences and nanotechnologies related to the nanomaterials used in quantum nanoelectronics, hybrid electronics, spintronics, optoelectronics or nanophotonics. This program also aims to enable students to acquire a responsible ethic in manufacturing and use of nanomaterials.

M2 is fully taught in English.

Semester 2 and 4 : 1.5 and 4 months internship in academic labs or industry.

### Engineering of Materials and Nanotechnologies

Interdisciplinary program at the frontier between physics and chemistry for applications in the fast developing field of energy storage and conversion or in the areas of durability of materials (corrosion, ageing, protection and recyclability) and health. To master the methods of elaboration, synthesis and physico-chemical characterization of materials and nanostructured material and to implement them.

Semester 2 and 4 : 3 and 6 months internship in industry or academic labs.

### Erasmus Mundus : Chemical NanoEngineering

Original program in the highly innovative domain of nano-engineering. Skills will be acquired at the strongly interdisciplinary level needed to master emerging nanotechnologies in many domains : biomedical nanotechnologies, nanomaterials or applications for environment. This course is fully taught in English.

Semester 1: Aix-Marseille University

Semester 2 : Wroclaw Univ. of Science and Technology

Semester 3 : University Roma Tor Vergata

Semester 4 : Master thesis

## Career Opportunities

Graduates will have the choice of applying, in France and abroad, for Ph.D. programs with the opportunity of a partnership academic Lab/Industry or working as scientist or engineer in industry (R&D, project management, quality control, production, consulting, ...).

The acquired skills will be highly appreciated by academic Labs and industries in the Material Science domain, especially in the following sectors : energy, nano- and microelectronics, information/communication, environment, health.

More information at :  <https://physique-sciences.univ-amu.fr/master-nanosciences-nanotechnologies>