UFR PhITEM
(physique, ingénierie, terre, environnement, mécanique)

Master in Nanosciences and nanotechnologies

Nanochemistry

Presentation

The programme is open to international students. All teaching is in English.

Two closely interconnected fields are addressed in the nanochemistry programme: construction of nano-objects and nanosystems (bottom-up approach), molecular recognition and intermolecular forces, activation and control of molecules and assemblies, surface functionalisation and transducers; characterisation of molecular assemblies, objects, materials and devices using the main physical analytical methods.

The programme is structured as follows:

- a foundation programme of 27 ECTS (15 credits in 1st year, 12 in 2nd year, 2 x 3 ECTS in a modern language) giving precedence to training through experimentation on dedicated platforms
- specific modules in nanochemistry (30 ECTS over the 2 years)
- elective modules for more in-depth study and leading on to other nanoscience disciplines (33 ECTS)
- two internships in a research laboratory: of 8 months in 1st year and 5 months in 2nd year (30 ECTS)

Objectives

The main aim of this programme is to train managers with solid scientific and technical skills in the field of nanomaterials, by providing a comprehensive vision covering the development and characterisation of physical, mechanical, chemical and biological properties, and applications for a wide variety of nanomaterials and nano-objects.

Registration and scholarships

Education requirements:

- For the first year : holders of a bachelor degree in chemistry or physics, or equivalent diploma.
- For the second year : students who have completed the first year of a compatible Master programme or equivalent level.

Admission criteria:

- See the section on applications and registration.

For candidates whose country of residence is not included in the "Studies in France" portal (PEF) scheme, the calendar for the eCandidat application campaigns is available here.

Public continuing education : You are in charge of continuing education:

- if you resume your studies after 2 years of interruption of studies,
- or if you followed a formation under the regime formation continues one of the 2 preceding years
- or if you are an employee, job seeker, self-employed.

If you do not have the diploma required to integrate the training, you can undertake a validation of personal and professional achievements (VAPP).

Would you like to apply and register?

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Be aware that the procedure differs depending on the diploma, the degree obtained, or the place of residence for foreign students. Let us guide you simply by following this link : https://www.univ-grenoble-alpes.fr/candidater-et-s-inscrire/

Further studies

This research programme offers two main career opportunities:

- doctoral studies in nanosciences and chemistry of materials, either in France or abroad, with a view to pursuing a career as teacher-researcher in a university, or researcher in a large public organisation (CNRS, CEA, etc.);
- engineer within a company or organisation in the chemistry or materials sector.

Practicals informations :

> **School :** UFR PhITEM (physique, ingénierie, terre, environnement, mécanique)
> **Duration :** 2 years
> **Course type :** Initial and Continuing Education
> **Location(s) :** Grenoble - University campus
> **Contacts :**

Programme director

Cyrille Train
cyrille.train@univ-grenoble-alpes.fr

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Programme administration

Registrar's Office for the Master in Nanosciences and nanotechnologies
phitem.master.nano@univ-grenoble-alpes.fr

Application
phitem.candidature.etudiant@univ-grenoble-alpes.fr

Program

Master 1st year

Semester 7

UE Surfaces and interfaces	3 ECTS	24h
UE Coordination and supramolecular chemistry	6 ECTS	50,5h
2 option (s) to choose from 7		
UE From solution to solid	6 ECTS	50,5h
UE Molecular biology	6 ECTS	48h
UE Polymers 1	6 ECTS	50,5h
UE Micro and nanofluidics	3 ECTS	24h
UE Solid state, electrons and phonons	3 ECTS	27h
UE Mechanics at the micro & nano-scale	3 ECTS	24h
UE Other program	3 ECTS	
1 option (s) to choose from 2		
UE Optical and magnetic spectroscopies	3 ECTS	25h
UE Optical spectroscopy	3 ECTS	22h
1 option (s) to choose from 2		
UE Occupational integration	3 ECTS	24h

UE French as a foreign language	3 ECTS	

Semester 8

UE Research internship 2	6 ECTS	
UE Nanosciences interdisciplinary practical trainings 1	6 ECTS	50h
UE Phase transition, transport and fluctuations : from nanomaterials to bilogic systems	6 ECTS	50h
UE Electrochemistry and molecular photophysics	6 ECTS	49,5h

3 option (s) to choose from 4

UE Nanophysics with local probes	3 ECTS	27h
UE Polymers 2 physico-chemistry	3 ECTS	25h
UE Modelling in systems biology	3 ECTS	
UE Other program	3 ECTS	

1 option (s) to choose from 2

UE French as a foreign language	3 ECTS	
UE English	3 ECTS	

Master 2nd year

Semester 9

UE Micro-nano fabrication	3 ECTS	26h
UE Research internship	3 ECTS	40h
UE Molecular nanomaterials	6 ECTS	40h
UE Inorganic nanoparticles	3 ECTS	24h

3 option (s) to choose from 8

UE Bio-molecular interactions : methods and applications	3 ECTS	20h
UE Characterization of bio-molecular interactions at surfaces	3 ECTS	20h
UE Nanocomposites	3 ECTS	20h
UE Polymers for nano-electronics	3 ECTS	20h
UE Molecular electronics and magnetism	3 ECTS	20h
UE Nano-safety	3 ECTS	21h
UE Nano-pores and membranes technologies	3 ECTS	20h
UE in an other program of the Nanosciences speciality or in another speciality	6 ECTS	

Semester 10

UE Master thesis	24 ECTS	64h

2 option (s) to choose from 5

UE English	3 ECTS	22h
UE French as a foreign language	3 ECTS	
UE Capita selecta lectures in nanosciences	3 ECTS	26h
UE Valorisation and intellectual property	3 ECTS	18h
UE Transverse teaching of choice	3 ECTS	