



**Duration**  
2 years



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



**Language(s) of  
instruction**  
English

## Presentation

This track is opened to international students. All courses are given in english.

The curriculum contains:

- General courses corresponding to 12 ECTS, among which 6 include the study of a foreign language
- Transverse courses in nanosciences and nanotechnologies (15 ECTS) with a large focus on experimental teaching and projects on the cleanrooms and nanosciences facilities of the Grenoble area
- Specific courses in nano-biosciences, (30 ECTS spread over the two years)
- Elective courses (totalizing 33 credits) for further specialization or opening in nanosciences
- Internships in research teams, 8 weeks the 1st year and 5 months the 2nd year, for preparing the master thesis

The main objective of this track is to provide students with strong scientific and technical knowledge in micro- and nano-fabrication, manipulation, measurement and instrumentation at the nano-scale. This include among other, the fonctionnalization of surfaces, the manipulation of single cells, the use of optical techniques for observation and manipulation of single bio-molecules, etc... The program provides students with strong basis in biology, allowing them to pursue ambitious projects at the interface between biology and nano-technologies.

This track offers two main perspectives:

- Continue with a PhD, in France or abroad. The interdisciplinary character of this track leads to a wide variety of domains, ranging from nanotechnologies in biophysics, to subjects more oriented toward biology or health engineering
- Become an engineer in a company or an organism, in the domain of nanotechnologies, biosciences, health engineering, regenerative medecine and/or biotechnologies

**International education** : Double degrees, joint degrees, Erasmus Mundus, Internationally-oriented programmes

## International dimension

Grenoble is a world-renowned competitiveness cluster in the field of nanotechnologies. Students are exposed to the international dimension of nanosciences and nanotechnologies, through international partnerships with universities and collaborations with numerous laboratories. Internships abroad are possible and actively encouraged. This program is part of the Erasmus+ Mundus master (EMM) consortium in Nanosciences and nanotechnologies. The EMM Nano students join the nanobiosciences program in the second year.

# Admission

---

## Access conditions

Education requirements :

- For the first year : holders of a bachelor degree in life sciences, 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)

---

## Candidature / Application

Would you like to apply and register ? 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](#)

---

## Target

Bachelors in Physics, with some knowledge and interest for biology, or bachelors in Biology, with an interest for physics and instrumentation

---

## Fees

Tuition fees 2019-2020 : 243 €

## And after

---

### Further studies

This track offers two main perspectives :

- Continue with a PhD, in France or abroad : The interdisciplinary character of this track leads to a wide variety of domains, ranging from nanotechnologies in biophysics, to subjects more oriented toward biology or health engineering
- Become an engineer in a company or an organism, in the domain of nanotechnologies, biosciences, health engineering, regenerative medicine and/or biotechnologies

## Useful info

---

## Contacts

### Program director

Johannes Geiselmann

✉ [Hans.geiselmann@univ-grenoble-alpes.fr](mailto:Hans.geiselmann@univ-grenoble-alpes.fr)

### Program administration

Registrar's Office for the Master in Nanosciences  
and nanotechnologies

✉ [phitem.master.nano@univ-grenoble-alpes.fr](mailto:phitem.master.nano@univ-grenoble-alpes.fr)

### Program administration

Application

✉ [phitem.candidature.etudiant@univ-grenoble-alpes.fr](mailto:phitem.candidature.etudiant@univ-grenoble-alpes.fr)

---

## Partner schools

Grenoble-INP

---

## Course location(s) - City

📍 Grenoble

---

## Campus

🏠 Grenoble - Scientific Polygon

---

## Know more

Master website

🔗 <https://master-nanosciences.univ-grenoble-alpes.fr>

# Program

## Master 1st year

### Semester 7

	Nature	CM	TD	TP	Crédits
UE Surfaces and interfaces	Teaching Unit (UE)	14h	10h		3 credits
UE Electromagnetism	Teaching Unit (UE)	14h	12h		3 credits
UE Micro and nanofluidics	Teaching Unit (UE)	14h	10h		3 credits
UE Mathematics for Biology	Teaching Unit (UE)				3 credits
UE Physics and electricity for biology	Teaching Unit (UE)			24h	6 credits
UE Polymers 1	Teaching Unit (UE)	21h	13,5h	16h	6 credits
UE Research project	Teaching Unit (UE)				6 credits
UE Mechanics at the micro & nano-scale	Teaching Unit (UE)	14h	10h		3 credits
UE Physics of biological systems	Teaching Unit (UE)				3 credits
UE Semi-conductors physics	Teaching Unit (UE)	16h	10h		3 credits
UE in another program	Teaching Unit (UE)				6 credits
UE Occupational integration	Teaching Unit (UE)				3 credits
UE French as a foreign language	Teaching Unit (UE)				3 credits

### Semester 8

	Nature	CM	TD	TP	Crédits
--	--------	----	----	----	---------

UE Nanosciences interdisciplinary practical trainings 1	Teaching Unit (UE)	28h	6 credits
UE Research internship 2	Teaching Unit (UE)		6 credits
UE Phase transition, transport and fluctuations : from nanomaterials to biologic systems	Teaching Unit (UE)	25h 25h	6 credits
UE Physics of the colloidal domain	Teaching Unit (UE)	16h	6 credits
UE Modelling in systems biology	Teaching Unit (UE)		3 credits
UE Polymers 2 physico-chemistry	Teaching Unit (UE)	19h 6h	3 credits
UE in other program	Teaching Unit (UE)		6 credits
UE French as a foreign language	Teaching Unit (UE)		3 credits
UE English	Teaching Unit (UE)		3 credits

## Master 2nd year

### Semester 9

	Nature	CM	TD	TP	Crédits
UE Micro-nano fabrication	Teaching Unit (UE)	10h		16h	3 credits
UE Research internship	Teaching Unit (UE)				3 credits
UE Biosensors & high through-put analysis	Teaching Unit (UE)	20h		16h	3 credits
UE Bio-molecular interactions : methods and applications	Teaching Unit (UE)	12h		8h	3 credits
UE Optics for bio systems	Teaching Unit (UE)	18h		2h	3 credits
UE Microfluidics	Teaching Unit (UE)			8h	3 credits

UE Physiology and neurosciences	Teaching Unit (UE)	36h	10h	6 credits
UE Cell signaling	Teaching Unit (UE)	16h		3 credits
UE Biostatistics, bioinformatics and molecular modeling	Teaching Unit (UE)			6 credits
UE Biomaterials engineering	Teaching Unit (UE)			3 credits
UE Surface fonctionnalization and electrochemistry	Teaching Unit (UE)	20h		3 credits
UE Molecular markers for medical Imaging	Teaching Unit (UE)	12h		3 credits
UE Nano-pores and membranes technologies	Teaching Unit (UE)			3 credits
UE Characterization of bio-molecular interactions at surfaces	Teaching Unit (UE)	20h		3 credits
UE Fundamentals of structural biology	Teaching Unit (UE)	11h	11h	3 credits
UE Optional program or MCMV with a specialisation in Physics	CHOICE			6 credits

## Semester 10

	Nature	CM	TD	TP	Crédits
UE Master thesis	Teaching Unit (UE)				24 credits
UE English	Teaching Unit (UE)				3 credits
UE French as a foreign language	Teaching Unit (UE)				3 credits
UE Capita selecta lectures in nanosciences	Teaching Unit (UE)				3 credits
UE Valorisation and intellectual property	Teaching Unit (UE)				3 credits
UE Transverse teaching of choice	Teaching Unit (UE)				3 credits