






Nanochemistry 1st and 2nd year

Master in Nanosciences and nanotechnologies

 Target level Baccalaureate +5	 ECTS 120 credits	 Duration 2 years	 Component UFR PhITEM (physique, ingénierie, terre, environnement, mécanique)	 Language(s) of instruction English
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Presentation

The course offers disciplinary training focused on development and characterization at the nanometric scale with a strong multidisciplinary dimension (physics, soft matter, biology). It relies on research units working in this field, in particular in relation to the Fondation Nanosciences de Grenoble.

It provides students with skills in the development, manipulation, characterization, understanding and exploitation of nano-systems, nano-materials, nano-structures and unique molecules, as well as knowledge of their application potentials. It makes students aware of the environmental and societal challenges of nanotechnologies.

The course is open to an international audience. All lessons are held in English during both years.

The program is structured as follows :

- A common program with Lab sessions on platforms dedicated to nanosciences
- Specific modules in nanochemistry
- Elective modules for more in-depth study and/or towards sister disciplines
- Two full-time internships in a research laboratory, 8 weeks during the 1st year and 5 months during the 2nd year.

Part-time research activity may be undertaken during the teaching period.

This Master Course gives you the opportunity to apply to the UGA Graduate School and one of its 15 thematic programs. The Graduate School@UGA is a new training program through and for research which was launched in 2021 within the Université Grenoble Alpes, and which concerns all the schools and components of the UGA.

The objective of these thematic programs is to offer interested students an interdisciplinary training program and academic excellence combining university studies and laboratory internships. Each thematic program develops a specific line of research, allowing then to embark on a PhD, or to have a direct professional insertion.

The program regroups students registered in different mentions, master programs or engineer school tracks and working together in specific courses

Participation in the Graduate School@UGA is for two years (M1 and M2) and may open the possibility of obtaining an academic scholarship for two years for the best international students (non-French baccalaureate holders).

For more information : <https://www.univ-grenoble-alpes.fr/education/graduate-school/>

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

International dimension

This program can be followed within the framework of an Erasmus Mundus in partnership Katholieke Universiteit Leuven (KU Leuven) (Belgium).

All students start their first year at the KU Leuven where they follow a common set of compulsory courses and some electives to prepare for their specialisation option.

For their second year, they select a specialization area at one of the Consortium Partners where they follow specialisation and broadening courses and do their master thesis research project.

Professor in charge of Erasmus Mundus: Mr. David FERRAND

Grenoble is a world-renowned competitiveness cluster in the field of nanotechnologies. Students can realise the international dimension of nanosciences and nanotechnologies, through international partnerships with universities and collaborations with numerous laboratories. Internships abroad are possible and encouraged. This program is part of the [Erasmus+ Mundus Master \(EMM\)](#) consortium in Nanosciences and nanotechnologies. The EMM Nano students join the nanochemistry program in the second year.

Organisation

Admission

Access conditions

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 \(VAPP\)](#)
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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

Graduates in Chemistry, Physical Chemistry, Materials Science, Chemistry-Biology

Fees

Tuition fees 2023-2024 : 243 €+100€ CVEC

And after

Further studies

This research program 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)
- Become an engineer within a company or organisation in the chemistry or materials sector

Sector(s)

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Useful info

Contacts

Responsable 1re année

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Responsable 2e année

Jerome Chauvin

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Program administration

Registrar's Office for the Master in Nanosciences and nanotechnologies

✉ phitem.master.nano@univ-grenoble-alpes.fr

Program administration

Application

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

Continuing education manager

Laura DI RUZZA

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Course location(s) - City

📍 Grenoble

Campus

🏠 Grenoble - University campus

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 Coordination and supramolecular chemistry	Teaching Unit (UE)			16h	6 credits
UE From solution to solid	Teaching Unit (UE)			16h	6 credits
UE Electrochemistry	Teaching Unit (UE)			12h	3 credits
UE Optic and magnetic spectroscopies	Teaching Unit (UE)				3 credits
UE Occupational integration	Teaching Unit (UE)				3 credits
UE French as a foreign language	Teaching Unit (UE)				3 credits
UE Polymers 1	Teaching Unit (UE)			16h	6 credits
UE Solid State Physics I	Teaching Unit (UE)				3 credits
UE Microscale mechanics and fluidics I : Mechanics	Teaching Unit (UE)				3 credits
UE Research Intensive Track I	Teaching Unit (UE)				3 credits
GS_Soft-Nano_UE_Research Methodologies	Teaching Unit (UE)				6 credits
1 or 2 UEs up to 6 ECTS in another program	Teaching Unit (UE)				

Semester 8

Nature	CM	TD	TP	Crédits
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UE Nanosciences I	Teaching Unit (UE)	17h		8h	3 credits
UE Nanosciences II	Teaching Unit (UE)	15h		11h	3 credits
UE Research Internship	Teaching Unit (UE)				6 credits
UE Molecular Photophysics	Teaching Unit (UE)	9h	4,5h	12h	3 credits
UE Thin films	Teaching Unit (UE)	15h	6h	4h	3 credits
UE Materials Science	Teaching Unit (UE)				3 credits
UE Surface functionalization and applications I	Teaching Unit (UE)				3 credits
UE Molecular electronics and magnetism	Teaching Unit (UE)				3 credits
UE Polymers 2 chemistry and physico-chemistry	Teaching Unit (UE)				3 credits
UE Physical measurements at nanoscale by local probes	Teaching Unit (UE)	22h		8h	3 credits
UE Physics of 2D materials: from elaboration to properties	Teaching Unit (UE)				3 credits
UE Ray-Matter Interaction	Teaching Unit (UE)	22h	3h		3 credits
UE Research Intensive Track II	Teaching Unit (UE)				3 credits
UE Graduate School Soft Nano internship	Teaching Unit (UE)				6 credits
1 or 2 UEs up to 6 ECTS in another program	Teaching Unit (UE)				

Master 2nd year

Semester 9

	Nature	CM	TD	TP	Crédits
UE Nano-safety	Teaching Unit (UE)	19,5h		4h	3 credits

UE Molecular nanomaterials	Teaching Unit (UE)	4h	6 credits
UE Functional Nanoparticles	Teaching Unit (UE)		3 credits
UE Advanced Functional Nanomaterials	Teaching Unit (UE)	8h	3 credits
UE Research training	Teaching Unit (UE)		3 credits
UE Polymers for flexible electronics	Teaching Unit (UE)	20h	3 credits
UE Nanocomposites	Teaching Unit (UE)		3 credits
UE Surface Functionalisation	Teaching Unit (UE)		3 credits
UE Characterization of bio-molecular interactions at surfaces	Teaching Unit (UE)	20h	3 credits
UE Nanomaterials and energy	Teaching Unit (UE)		3 credits
UE Micro-nano fabrication techniques	Teaching Unit (UE)	12h	3 credits
UE Bio-molecular interactions : methods and applications	Teaching Unit (UE)	12h	12h 3 credits
UE From nanofabrication in research laboratories to VLSI	Teaching Unit (UE)	24h	3 credits
UE Advanced characterization for Nanostructures	Teaching Unit (UE)		3 credits
UE Large Scale Facilities for Soft Matter	Teaching Unit (UE)		3 credits
UE Advanced semiconductor devices	Teaching Unit (UE)	8h	3 credits
UE Nano-pores and membranes technologies	Teaching Unit (UE)		3 credits
UE Elaboration of nanostructures / physics of 2D materials	Teaching Unit (UE)		3 credits
UE International School in Soft Nanoscience (ESONN)	Teaching Unit (UE)		6 credits

UE Current trends in nanosciences	Teaching Unit (UE)	16h			3 credits
1 UE (6ETCS) OU 2 UE (2 UE de 3 ECTS) in an other program of the Nanosciences speciality or in another speciality	CHOICE				6 credits

Semester 10

	Nature	CM	TD	TP	Crédits
UE Master Thesis	Teaching Unit (UE)				30 credits