



Core activities

Year	Activity	Participation	Hours recorded
1	BOOTCAMP	Mandatory	4
1	BASICS FOR RESEARCH		
1	Open Science	Mandatory	2
1	Ethics & Integrity	Mandatory	3
1	Write & publish your paper	Recommended	21
1	General public communication	Recommended	3
1	Research transfer	Recommended	3
1	AI for research	Recommended	3
1	Enseignement	Recommended	7
2	Thesis writing	Mandatory	7
3	3RD YEAR MEETING	Mandatory	4
Each year	DOCTORAL SCHOOL DAY	2 mandatory participations, with at least 1 presentation (poster or communication)	0
		TOTAL	57

Basics for research

Our recommended courses for 1st year PhD students in physics, chemistry and geosciences. This program will allow you to validate around 50 hours out of the minimum 100 hours required.

Open science 2 hours (Marine Bernard)

Open science is profoundly transforming research practices and has become a requirement of funders, institutions, and the scientific community. This course will introduce PhD students to the core principles of open science, open-access publishing, managing and sharing research data in accordance with the FAIR principles, and exploring citizen science.

Ethics & integrity 3 hours (Pierre Cointe or Guillaume Durand)

This course aims to develop PhD students' informed and critical understanding of ethical issues in scientific research. It also prepares them to integrate research ethics and integrity requirements into their current and future work. Through group discussions, students will address key topics such as authorship, collaborations, data collection and conflicts of interest.

Write & publish your paper 21 hours (Gabriele Hess-Fernandez)

With this course, PhD students will get practical advice and guidance on how to structure a research article, write it and get it published in international journals; explaining every step of the process, from choosing a suitable journal for your work, to presenting the results and citing references. We will work on your writing skills and discuss ethical issues important in scientific publishing.



General public communication 3 hours (Ulysse Pedreira)

This course is an introduction that explores the basics of science communication to the general public (scicom). In addition to providing students with the basic concepts and theory of scicom, it will be an opportunity to explore the rich local scicom ecosystem and to participate in hands-on activities that are essential to the creation of any scicom project.

Research transfer & innovation 3 hours (Mallory Pain-Lardeux & Valérie Viranaïken)

This course dedicated to PhD students in physics, chemistry and geosciences will give you basic tools of intellectual property, research transfer and patents (brevets). The aim is to provide you with essential notions to protect your results, turn your current research into innovation and pursue a career in the academic or R&D sectors.

AI for research 3 hours

This course on generative AI for research aims to share experiences with tools that can be easily used in daily research, demonstrating both their possibilities and potential limitations.

Enseignement 6 heures (Yasmine Filali)

Cette formation vise à travailler sur les points clés à avoir en tête avant de se lancer dans l'enseignement d'un module de TD ou de TP en chimie, physique ou géosciences. L'objectif est d'apprendre à s'appropriier les caractéristiques d'un module, à organiser une séance et à participer aux modalités d'évaluation.

Thesis writing 7 hours (Gabriele Hess-Fernandez)

This interactive workshop dedicated to thesis writing combines practical guidance, peer exchange, and mentoring. Led by an experienced scientific writing trainer and with the participation of scientists from your lab, it will give you tools and techniques to help clarify your ideas, write more effectively, and overcome common roadblocks.

Elective courses

Computational tools

Introduction to Python for data analysis 7 hours (Damien Vintache)

This course is designed to introduce the Python programming language for scientific research and is aimed at those who are least at ease with developing and analyzing data with Python, to provide them with the knowledge they need to become autonomous.

Python for data analysis: Numpy/Matplotlib 6 hours (Benoît Seignovert)

This course will focus on Numpy and Matplotlib libraries, which are at the core of Python ecosystem for scientific data analysis, and is intended for PhD students who already have some basic knowledge of Python and who wish to improve their skills with these two libraries.

Introduction to LaTeX 6 hours (Boualem Merainani)

This introductory course offers PhD students a hands-on approach to using LaTeX for academic and scientific writing. It introduces the core principles of LaTeX, highlights its advantages over traditional word processors, and shows how to create well-structured, professional documents. Participants will discover how to write mathematical formulas, insert figures and tables, manage bibliographies, and collaborate efficiently to produce research papers, theses, and presentations.



Introduction to OriginPro: scientific data analysis and visualization 9 hours (Loubna Hadhoum)

The aim of this course is to provide participants with a solid introduction to using OriginPro for effective data analysis and scientific graphing. The course focuses on building practical skills to efficiently import, organize, explore, and present datasets using OriginPro's intuitive tools.

Introduction to High Performance Computing 8 hours (Luisa da Silva)

This course covers fundamentals of parallel computing and GPU acceleration. Participants will learn how to connect to the GLiCID cluster, a regional support unit that provides shared resources for high performance computing and exploitation of computationally-related research data.

AI from scratch to material or molecular design 6 hours (Isabelle Braems)

This session offers a gradual immersion into AI applied to molecular and material design, to provide participants with the conceptual tools they need to know how to represent matter, predict properties, and generate new structures. The goal is to provide an intuitive understanding of the issues at stake: what questions can AI solve in chemistry and materials science, and which ones still elude current approaches?

Introduction to atomistic simulations 18 hours (Nicolas Galland)

The aim of this course is to develop a critical view of modeling and its relevance in chemistry, solid state physics and structural biology: advantages and limitations of techniques commonly used at different scales to model molecules, nanomaterials, periodic solids and biological systems. PhD students will learn to apply the appropriate technique(s) to model and analyze elementary properties.

Initiation to...

Contributions of microscopy - towards nano characterization 6 hours (Philippe Moreau)

This course introduces PhD students to the broad possibilities offered by modern microscopy. After placing microscopy in the context of research and industry, it covers the fundamentals of photonic, scanning probe and electron microscopy. Through concrete examples across multiple disciplines, students will better understand image resolution, contrast and potential applications relevant to their own research.

Energy loss of fast particles through matter 20 hours (Stéphane Peigné)

This course is primarily intended for PhD students in particle physics (experimental or theoretical). To get the most out of the course, it is preferable to be somewhat familiar with elementary particles (electrons, positrons, photons, quarks, gluons, etc.). Lessons at the blackboard are designed to be interactive, with several exercises offered to students so they can learn by doing.

Photosciences 6 hours (Yann Pellegrin, Vincent Coëffard & Clémence Queffélec)

This course will introduce you photosciences and photochemistry. You will learn how to identify the key elements of a photochemical reaction, understand activation modes in photocatalyzed processes and recognize the potential of photosciences in synthesis, materials, and medicine.

Les médicaments de l'Antiquité à nos jours 6 hours (Jacques Le Breton)

Cette formation retrace, depuis le néolithique, les grandes étapes de l'évolution des pratiques thérapeutiques. Elle montre comment les savoirs empiriques et les découvertes scientifiques ont conduit à la création des médicaments tels que nous les connaissons aujourd'hui.



Looking for more courses? The Regional Doctoral College, the University Library and the others doctoral/graduate schools offer also general and scientific courses.





Training equivalences

If you take courses outside AMETHIS or carry out **specific activities** during your PhD, **you can benefit from equivalence hours which will be included in the calculation of the minimum 100 hours required**. The maximum hourly rate indicated is valid for the entire duration of the thesis.

Code	Type of activity	Hours recorded	Documents to provide
EQ-3MG-TAKE ONLINE COURSES (MOOC)	MOOC, tutorials and keynotes in the scientific field of the thesis	max 20	Certificate of achievement from the organizing institution with the number of hours completed
EQ-3MG-MASTER COURSE	Master's level courses	max 30	Certificate of attendance from the organizing institution with the number of hours completed
EQ-3MG-CERTIFYING TRAINING	Training outside AMETHIS in the scientific field of the thesis	max 15 per course	Certificate of attendance from the organizing institution with the number of hours completed
EQ-3MG-THEMATIC SCHOOL	Participation in a winter/summer school	max 15	Certificate of attendance from the organizing institution with the number of hours completed
EQ-3MG-SCIENTIFIC ACHIEVEMENT	Participation in a national or international conference with poster presentation or oral communication	max 20 (max 10 per conference)	Certificate of attendance from the organizing institution and link to the program to identify your presentation
EQ-3MG- SCIENTIFIC CULTURE	Actions of communication to the general public: Fête de la Science, Petits débrouillards, Nuit blanche des chercheurs...	max 15	Certificate of participation from the organizing institution and description of the actions carried out specifying the number of hours
EQ-3MG- ORGANIZATION EVENT	Participation in the organization of an event: seminar, congress, conference, Doctoral School Day...	max 12	Certificate of participation from the organizing committee and description of the activities carried out specifying the number of hours
EQ-3MG- INVOLVEMENT BODIES	Participation in bodies related to the PhD: PhD students associations, student committee, laboratory council, doctoral school steering committee...	max 15	Certificate of participation with the list of meetings attended during the PhD
EQ-3MG- READING	Participation in a review committee	max 5	Certificate of participation and description of the activities carried out
EQ-3MG- TUTORING	Bachelor or Master students project tutoring	max 15	Certificate of participation from the organizing institution and description of the activities carried out specifying the number of hours
EQ-3MG- QUOTA-CIFRE/COTUTELLE	Exemption for professional experience: - CIFRE or cotutelle agreement - Main job not related to the thesis	max 50	Work contract or agreement