

Master in Earth, planetary and environmental sciences

Earth System Sciences 1st and 2nd year

Presentation

The Earth System Sciences program is aimed towards research, generally but not necessarily aiming for a doctoral thesis. The program aims both at offering a robust knowledge of the solid Earth and to envision the solid Earth as belonging to a global system, by analyzing the interactions with its external envelopes: the hydrosphere, atmosphere, cryosphere, biosphere, and planets.

The Earth System Sciences program offers a broad panel and multiple options, which allow for individualized learning paths to be designed. Each semester cumulates 30 ECTS (ignore indications "x options au choix parmi N")

Training is designed to jointly provide theoretical and practical approaches, with multiple field-based teaching classes.

Several UE are opened jointly to M1 and M2 student, on a biannual basis (alternatively opened during odd and even years).

Some of the optional UE are (rarely) unavailable, for technical or administrative reasons.

Teaching will be partly in English.

This transdisciplinary program is conceived and articulated around scientific questions, for which methods and techniques come in support. It offers a range of options, which leave the possibility to develop personal tracks. These tracks can either be more focused towards the internal Earth, with extensive teaching on the physical and chemical evolution of the Earth, or more oriented towards the outer spheres of the Earth, making connections with surface interactions (geomorphology, surface processes). As such, it also permits to expand the curiosity, and reach for scientific questions that may be considered marginal to the main learning path.

While the core of the program revolves around the solid Earth, students will be eligible for interdisciplinary research programs, involving for instance ecology or climate, namely in the field of Earth System Sciences. The many options proposed by Earth System Sciences program will yield an individual scientific signature to each student, who shall become rare specialists, each with a unique interdisciplinary flavor.

The Earth System Sciences program of the Solid earth major aims to train specialists who intend to enter employment after preparing a doctoral thesis, working for academia, governmental and non-governmental authorities, agencies and organizations, as well as consulting.

Registration and scholarships

Access conditions

- The 1st year is open to students who have obtained a national diploma equivalent to a bachelor degree (licence) in a field compatible with that of the master, or via a validation of their studies or experience
- Entry to the 2nd year may be selective. It is open to candidates who have completed the first year of a Master in the field, subject to a review of their application

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 training under the continuous training regime one of the previous 2 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 \(VAPP\)](#)

skin.odf-uga:SKIN_ODF_CONTENT_PROGRAM_CANDIDATURE_LABEL

You want to apply and sign up for a master? Please be aware that the procedure differs depending on the diploma you want to take, the diploma you have already obtained and, for foreign students, your place of residence. Let us be your guide – simply follow this [link](#)

Prerequisites

- Natural candidates for this course include students with bachelor degrees (licence) in Earth Sciences, especially if their studies included a fairly large physics component
- However, due to the highly multidisciplinary nature of the course, it is also perfectly suited to students with bachelors in physics, mechanics, physics-chemistry, and even chemistry
- A small but non-negligible number of students come from engineering schools, seeking studies in more "research" oriented topics

Target group

- Students in initial training who have obtained a bachelor degree (licence) in Earth, physical, or mechanical sciences
- Students from engineering schools (in particular ENSE3, G-INP) who seek studies in more "research" oriented topics concerning the atmosphere, the climate and hydrosystems
- Foreign students wishing to pursue their studies in the fields of the atmosphere, the climate and hydrosystems
- Students in continuing education wishing to pursue advanced studies in the fields of the atmosphere, the climate and hydrosystems

Expenses

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

Further studies

Doctoral thesis, in the field of Earth, planetary and environmental sciences

Practicals informations :

- > Component : UFR PhITEM (physique, ingénierie, terre, environnement, mécanique)
- > level : Baccalaureate +5
- > Duration : 2 years
- > Course type : Initial and Continuing Education
- > Location(s) : Grenoble - University campus

Contacts

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Program

Master 1st year

Semester 7

12 Option	
UE Lithosphere dynamics (2024-2025)	6 ECTS
UE Tectonics and surface processes (2023-2024)	6 ECTS
UE Petrology	6 ECTS
UE Petrology field course	3 ECTS
UE Plio-Quaternary climates and landforms (2024-2025)	3 ECTS
UE Solid Earth and the atmosphere, hydrosphere, biosphere (2023-2024)	3 ECTS
UE Surfaces planétaires	3 ECTS
UE Geophysical observation of the Earth	6 ECTS
UE Introductory Field Course - Professional project	3 ECTS
UE Programmation et environnements informatiques	3 ECTS
UE Physics and Chemistry of the Earth	6 ECTS
UE Geomechanics	3 ECTS

Semester 8

12 Option	
UE Remote sensing and GIS project	6 ECTS
UE Basin analysis	6 ECTS

UE Sedimentology field course	3 ECTS
UE Multidisciplinary field course	6 ECTS
UE Lautaret Field Course: Snow-Atmosphere interface	6 ECTS
UE Climate records	3 ECTS
UE Deep Earth Geodynamics	6 ECTS
UE Data sciences & Inverse problems	3 ECTS
UE Volcanic dynamics and hazards	3 ECTS
UE Environment records	3 ECTS
UE Scientific computing	3 ECTS
UE Sciences, pseudosciences, & pensée critique	3 ECTS

Master 2nd year

Semester 9

12 Option	
UE Lithosphere dynamics (2024-2025)	6 ECTS
UE Tectonics and surface processes (2023-2024)	6 ECTS
UE Tectonics-Metamorphism field course	3 ECTS
UE Active Faults	6 ECTS
UE Intérieurs planétaires	3 ECTS
UE Dynamique des fluides géophysiques	6 ECTS
UE Doctoral School - InternalEarth@les Houches	6 ECTS

UE Climate change	6 ECTS
UE Ecologie, biogéographie, évolution	6 ECTS
UE Fieldtrip Mountain Building, Climate, and biodiversity	3 ECTS
UE Solid Earth and the atmosphere, hydrosphere, biosphere (2023-2024)	3 ECTS
UE Plio-Quaternary climates and landforms (2024-2025)	3 ECTS

Semester 10

UE short Internship	6 ECTS
UE long Internship	24 ECTS