Master in Earth, planetary and environmental sciences

Système Climatique : Atmosphère, Hydrosphère, Cryosphère 1st and 2nd year

Presentation

The Climate System: Atmosphere, Hydrosphere, Cryosphere course aims to study the processes operating in the climate system and their interactions. Understanding past and present climate and predicting future changes requires a precise knowledge of these processes. This Course addresses all the surface components of the Earth, the atmosphere, the continental surfaces (water, cryosphere, biosphere) and the ocean. It draws on a variety of disciplines and skills, including physics, chemistry, mathematics, geosciences, geography, and computer science.

The course trains generalist experts and has a research focus, but also responds to the growing needs of local authorities and companies in the field of the environment, for example in air quality, hydrology, or remote sensing. The teaching relies heavily on the specificities of Grenoble's research laboratories in the field of climate, atmosphere and cryosphere and glaciology (IGE, LEGI, INRAE, CEN). The observation made today is that 70% of the students pursue a PhD after this master (reflecting individual choice rather than any selection). The tools used in the courses, workshops and projects are in fact also the tools used in the professional world, or in the process of being used. The course's greater openness to the professional world is achieved through the introduction of professionally oriented courses, as well as by taking care in the general modules to systematically make the necessary links with "business" applications: climate variability and intermittency of renewable energy resources.

The course includes fieldwork (1 compulsory week + 1 optional week + occasional days), numerous practical assignments (e.g. 1 week in atmospheric chemistry) which allow theoretical knowledge to be put into practice.

Finally, the course includes two internships in a laboratory or in a company, of one's choice. These internships take place between M1 and M2 (6 weeks minimum but 2-3 months recommended) and at the end of M2 (5 months minimum). For those interested in an even stronger involvement in research (2 internships of 5 months over the two years), the Research Intensive Track associated to the Climate System Course may be an option, provided that you already have a master's or professional experience.

Note that in the first semester, there are 30 ECTS of compulsory courses in the program, which is sufficient to obtain validation of the semester, the two options proposed are for special cases and not necessarily open every year. In the second semester, the remote sensing and GIS course is marked as optional but is strongly recommended unless you already have a strong competence in the field or a specific professional project that justifies other module choices.

This Master Course gives you the opportunity to apply to the UGA Graduate School and one of its 15 thematic programmes that add an interdisciplinary component to your studies. Terra is the thematic programme closest to this Course. The objective of the thematic programmes is to offer students an interdisciplinary study programme combining academic teaching and training through laboratory research. The programme brings together students from different majors, master's courses or engineering programmes and works together in specific courses. Participation in the @UGA Graduate School 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).

More information on the Graduate School website

Registration and scholarships

- 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)

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

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

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

Program under construction - awaiting CFVU vote

Master 1st year

Semester 7

UE Climate and environmental variability	6 ECTS
UE Organic geochemistry: pollutants, modeling	6 ECTS
UE Scientific & professional communication	3 ECTS
UE Hydrology and hydraulics	6 ECTS
UE Meteorology: 1D and synoptic	3 ECTS
UE Fluid mechanics	3 ECTS

1 option(s) to choose from 1

UE Intro workshop - professional project	3 ECTS

Semester 8

UE Remote sensing and GIS project	6 ECTS
UE Pollution atmosphérique : principes et méthodes expérimentales	6 ECTS
UE Lautaret field workshop: snow & atmosphere interface	6 ECTS

2 option(s) to choose from 4

UE Field workshop hydrology and hydrometeorology	6 ECTS
UE Instrumentation and metrology	6 ECTS
UE Climate archives	3 ECTS
UE Environmental flows	3 ECTS

Master 2nd year

Semester 9

5 option(s) to choose from 13

UE Models for the physico-chemistry of the atmosphere	6 ECTS
UE Atmospheric boundary layer : from fundamentals to air quality 1	3 ECTS
UE Atmospheric boundary layer : from fundamentals to air quality 2	3 ECTS
UE Cryosphere	6 ECTS
UE Climate and anthropogenic impact	6 ECTS
UE Hydrology of continental systems	6 ECTS
UE Dynamics of geophysical fluids	6 ECTS
UE Radiative transfer and remote sensing	6 ECTS
UE Numerical modeling workshop	6 ECTS
UE Wave dynamics	3 ECTS
UE Ocean dynamics	3 ECTS
UE Inverse methods and assimilation	6 ECTS
UE Geostatistical	6 ECTS

Semester 10

1 option(s) to choose from 2

UE Research internship
UE Company internship