

Climate

Climatology deals with climate and the statistical analysis of its various components. Climate is defined as “*the typical succession of atmospheric conditions above a given location.*” Climatology is the science that provides a systematic description and explanation of the world’s climate zones.

Climate research involves multiple spatial scales, each of which constitutes a field of study. For instance, agro-meteorology produces forecasts useful to farmers whereas bioclimatology and biometeorology study how climate influences lifeforms. Climatology often intersects with other disciplines such as physics, physiology, ecology, agronomy, and medicine.

Climatology students initially focus on indoor climate control systems as they relate to renewable energies and energy efficiency. Temperature and air control in industrial contexts is an example of climatology being applied to installations and manufacturing processes.

Students can later specialize in the sciences, health technologies, or marine and coastal sciences. When studying climate and the atmosphere, climate change is viewed through the lens of sustainable development and the geosciences.

Climate and energy transition in France by the numbers

- 12% reduction of GHG emissions (1990-2012)
- 30% reduction of fossil fuel consumption (by 2030)
- 32% increase in the share of renewable energies (by 2030)
- 40% reduction of GHG emissions (by 2030)
- 50% reduction of total energy consumption (by 2050)
- 75% reduction of GHG emissions from 1990 levels (by 2050)

Source: French Ministry of Ecology, Sustainable Development, and Energy
www.developpement-durable.gouv.fr - www.cop21.gouv.fr

INTERNATIONAL

France, a signatory to the Kyoto Protocol, hosted and led the 2015 Conference of Parties of the United Nations Framework Convention on Climate Change (COP21/CMP11) from November 30 to December 11. The objective was to forge a commitment by the international community to preventing the earth from warming more than 2°C.

Within the European Union, France has taken an ambitious stance. It aims to reduce greenhouse gas emissions by 40% by 2030 and by 60% by 2040 (compared to 1990 levels). France is supporting priority areas of research in light of warnings from the Intergovernmental Panel on Climate Change (IPCC) and the role humankind plays in climate change.

The MISTRALS (*Mediterranean Integrated Studies at Regional and Local Scales*) initiative pools the research efforts of many countries of the Mediterranean basin.

- www.mistrals-home.org

Related fields

Agriculture - Energy - Geosciences - Meteorology - Oceanography - Health - Environmental sciences - Earth sciences - Life sciences

Subfields

Food - Atmosphere - Bio-geosciences - Climate change - Sustainable development - Water - Ecology - Emissions - Carbon footprint - Alternative energies - Environment - Greenhouse gas - Ocean - Pollution - Global warming - Earth

Useful links

- Resource center on greenhouse gas emissions: www.bilans-ges.ademe.fr
- French Center for Meteorological Research (CNRM): www.cnrm.meteo.fr
- French and global climate data: www.statistiques.developpement-durable.gouv.fr/publications/>Repères
- Climat-Environnement-Société, a French scientific interest group: www.gisclimat.fr
- 2015 Paris Climate Conference (COP21): www.diplomatie.gouv.fr>Politique étrangère de la France>Environnement et développement Durable
- 2015 Paris Conference (COP21-CMP11): www.cop21.gouv.fr
- United Nations Framework Convention on Climate Change (UNFCCC): <https://unfccc.int>
- École Nationale de la Météorologie (ENM): www.enm.meteo.fr
- Energies and climate: research challenges: [www.cea.fr/energie/energies-climat-les-defisde-la-recherche](http://www cea.fr/energie/energies-climat-les-defisde-la-recherche)
- Energies and climate, observation and statistics, French Ministry of Ecology, Sustainable Development, and Energy: www.statistiques.developpement-durable.gouv.fr>Énergies et climat
- ENM Météo - École Nationale de la Météorologie-INP Toulouse: www.enm.meteo.fr
- Letter on climate research by the scientific interest group Climat-Environnement Société: www.gisclimat.fr>Nos activités>Diffusion scientifique
- Ministry of Ecology, Sustainable Development, and Energy (MEDDE): www.developpement-durable.gouv.fr>Énergie, air et climat
- La Recherche, climatology section: www.larecherche.fr/savoirs/climatologie
- Sagascience, collection of multimedia data on multiple topics (climate, earth climate, polar climate, etc.) by the French National Center for Scientific Research (CNRS): www.cnrs.fr/cw/dossiers/saga.htm

CHOOSE YOUR PROGRAM

- Campus France program catalogue: www.campusfrance.org>Trouvez votre formation
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- Catalogue of short academic programs and language courses: www.coursdete.campusfrance.org
- CampusBourses, financing your studies in France: www.campusfrance.org>Financez vos études

Licence level

Brevet de Technicien Supérieur (BTS, higher technical certificate)

(Secondary diploma + 2 years of higher education) – L2

The **BTS** in **fluids, energies, and domotics** with a concentration (*option*) in **indoor climate control systems and fluidics** is offered by 50 schools (public and private high schools, and CFA's, or apprentice training centers). Such programs provide technical training focused on HVAC systems (heating, ventilation, and air conditioning) and indoor sanitation. Subjects taught include: thermal energy, hydraulics, aerualics, acoustics, maintenance, electrical engineering, climate control, energy management, and regulations.

- www.campusfrance.org>Espace documentaire>Offre de formation>Fiches Diplômes>BTS

Professional licence

(Secondary diploma +3 years of higher education) - (L2 +1 year)

Some 60 schools (universities and institutes of technology) offer the professional *licence* in **climate control systems** with concentrations available in:

- Installation design
- Sustainable development
- Energy efficiency and expertise
- Renewable energies
- Installation management and maintenance
- Energy management.

- www.campusfrance.org>Trouvez votre formation>Licence

Licence

(Secondary diploma +3 years of higher education) - (L2 +1 year)

50 schools offer a *licence* in **earth and environmental sciences**. This degree covers the fields of geology, geophysics, geochemistry and hydrogeology while introducing students to **glaciology** and **atmospheric and climate sciences**. Students complete a portion of their studies in the field.

- www.campusfrance.org>Trouvez votre formation>Licence

Master level

Master

(Secondary diploma +5 years of higher education) – M2

Three schools offer master's degrees in climate studies. The following specialty areas are available:

- Sciences, technologies, and health; Geography and environment track with the following concentrations:
 - **Atmosphere, climate, and spatial observations**
 - **Climate, risks, environment, and health**
 - **Climate and spatial observations**
 - **Climate and vineyards**
 - **Water, climate, and environment**
- Marine and coastal sciences with the following concentrations:
 - **Oceans, atmosphere, climate and remote sensing**
 - **Physics of the ocean and climate.**
- Humanities and social sciences in geography with a concentration in:
 - **Transportation, mobility, environment, and climate.**

- www.campusfrance.org>Trouvez votre formation>Master

Programs in English:

- *Agrosociences, environment, territory, landscape, forests: climate, land-use and ecosystem services*
- Université Paris-Saclay:
www.universite-paris-saclay.fr/en/education/masters

Diplôme d'ingénieur (engineering degree) / Master

(Secondary diploma +5 years of higher education) – M2

French engineering schools offer engineering and master's degrees accredited by the CTI (*Commission des Titres d'Ingénieur*).

Two schools offer the *diplôme d'ingénieur* in the area of energy and climate:

- École d'Électricité de Production et des Méthodes Industrielles (Cergy)
 - www.ecam-epmi.fr>Nos Formations
- Institut National des Sciences Appliquées de Strasbourg, in partnership with Institut des Techniques d'Ingénieur de l'Industrie Alsace (ITII Alsace) à Mulhouse.
 - www.insa-strasbourg.fr>Formations
 - www.itii-alsace.fr

In the areas of atmospheric and oceanic modeling, hydrology, air quality, renewable energies, scientific computing, and climate change:

- Institut National Polytechnique de Toulouse (INP)-ENSEEIH
École Nationale de la Météorologie (ENM Météo)
 - www.enm.meteo.fr>Métiers et formations>Ingénieur et Master

Beyond the master level

Mastère Spécialisé (MS, specialized master)

(M2 +1 year of higher education) – post-M

Labeled by the *Conférence des Grandes Écoles* (CGE), the specialized master enables students to earn an institutional credential attesting to dual competence:

Management of Sustainable Development and Climate Change

Co-accreditations:

- École Nationale de la Météorologie (ENM): www.enm.meteo.fr
- Institut National Polytechnique de Toulouse (INP Toulouse) - École Nationale Supérieure Agronomique de Toulouse (INP-ENSAT): www.ensat.fr
- Toulouse Business School (TBS): www.tbs-education.fr
- Additional information on the MS degree:
www.campusfrance.org/fr/ressource/les-masteres-specialises-ms
- List of MS programs: www.cge.asso.fr/nos-labels/ms

L'École Nationale de la Météorologie (EMN, National School of Meteorology)

ENM teaches students how to understand the atmosphere and predict its behavior, as well as how to produce, share, and use meteorological and climate data in a wide array of contexts. Not only do students learn how to analyze and perform critiques, they also learn how to lead and coordinate teamwork. ENM is the only French institution of higher learning that offers programs devoted entirely to the meteorological and climate sciences.

ENM offers degree programs geared toward research (Master's in Ocean – Atmosphere – Continental Surfaces, and MS in eco-engineering), as well as programs rooted in the practical applications of the meteorological and climate sciences. Through European and international networks, the school is involved in numerous bilateral cooperation, research, and training initiatives (Francophone Africa, Eastern Europe, Maghreb, etc.).

- INP Toulouse-ENM Météo France: www.enm.meteo.fr