

**Course: Climate dynamics and change**

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Period: 2nd Semester

Duration: 25 hours

**Program**

The topic of climate change and its present and future consequences has now become of daily relevance in the physical, natural, economic and social sciences, as well as in the political debate. The climate system is characterised by complex interactions between atmosphere, ocean, ice, soil and biosphere: the knowledge of the dynamics of these interactions is crucial for understanding the implications of climate change and predicting its impact. The aim of this course is to provide students with the minimum tools to interpret and communicate the knowledge produced and disseminated by the scientific community on climate change, and integrate it within their personal, educational and professional path.

The course covers:

- 1) The physical processes of the climate system;
- 2) The main characteristics of climate variability and global change;
- 3) The tools for climate observation, analysis and forecasting;
- 4) The periodic reports of the Intergovernmental Panel on Climate Change (IPCC).

**Information**

The course will take place mainly in the form of frontal lectures. During the course, scientific articles concerning climatic events of particular interest and relevance will be proposed, and students will be invited to choose one of them and to present its content to the class. A practical activity will also be proposed in which students will be trained to find climate data and perform basic analysis.

The material of the course is in English. Lectures will be held in English.

**Bibliography**

- Material presented during the lessons.
- J.D. Neelin, 2011: Climate change and climate modelling
- P. Peixoto & A.H. Oort: Physics of Climate, AIP & Springer Verlag, 1992, ISBN 0 88318-712-4
- Climate Change 2022: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. IPCC, Geneva, Switzerland, <https://www.ipcc.ch/report/sixth-assessment-report-cycle/>