ID

TM15_Dip_ScTerra

Teach Mob – Visiting Professors
Academic year 2014/2015

1st term

COURSE TITLE
Climate, Natural Systems And Society

Scientific area
Earth Sciences

Department of Life Sciences and Systems Biology

Language used to teach
English

Course summary

The course is focused on general climatology and climate interactions with natural systems and society. In the first parts global principles of climate are presented to students to achieve a general level of knowledge, and in the second part some interactions of climate with naturals systems and society are presented. The main lectures are as follows (c. 30 hours):

Lecture 1. Climate as a component of Earth Systems. Main concept (2hr)
Lecture 2. Atmosphere: structure and composition. Solar radiation at Earth, laws and principles (2hr)
Lecture 3. Earth energy budget (2hr)
Lecture 4. Temperature: factors and distribution. Understanding global warming and climate change (4hr)
Lecture 5. Atmospheric pressure and winds (4 hr)
Lecture 6. Atmospheric humidity and precipitation (4 hr)
Lecture 7. Air masses weather types and perturbations (4hr)
Lecture 8. Climates of the world and climate classifications (4 hr)
Lecture 9. Climate and geomorphology: rainfall kinetic energy and rainfall indices on soil erosion processes (2 hr).
Lecture 10. Climate and society: air pollution and weather types (2 hr).

These general items (lectures, i.e. classical presentations) are accomplished by sequential practical activities developed by students (see below). These activities include original database management and basic treatment of data.

Learning objectives

At the end of course the student should be able to:

1) Achieve a general and basic level (different students = diff. background) of main climate elements and processes.
2) Is able to recognize the main factor that contribute to spatial distribution of climate elements and processes
3) Know the importance of climate as a component of Earth System and identifies and relates climate

processes with other spheres processes (biota, geomorphological processes, society...),including global warming and climate change
4) Is able to produce basic report on climate from original data
5) Is able to understand synoptic chart and relate with other ecosystems processes as erosion, pollution etc
6) Irrespectively of his original background, is able to participate in research and professional activities in which climate is involves (i.e. EIA, landscape planning, environmental risk etc)

Tutorship activities

The student should produce a personal report on climate analyses data from two well contrasted stations (ECA dataset is a nice tool). A nice strategy is working by couples, i.e. two students works together, we say a cross north-south four stations gradient, althout each ones must particularly focus on his individual objectives

To solve particular questions, a calendar for seminars should be organized to discuss specific points.

In my experience these activities reinforce the results if seminars are organized for a small number of students (no more than 5-6), when each one must to think about other problems and sometimes is an starting point of collaborative aptitudes between them.

Lab activities

Practical work includes personal and individual activities (under my supervision) as follows (26 hr):
- Interpolation and basic features of climate maps (2 hr).
- Dadatabase, data organizing, and quality control (8 hr)
- Data analyses
  * Temperature and precipitation, from daily value to monthly mean. Trend analyses (4 hours)
  * Atmospheric humidity and atmospheric sounding (4 hours)
  * Synoptic chart and weather types (2 hr)
  * Climate diagrams,climograms,diagrams of Walter-Lieth (3 hr)
  * Climate indices: rainfall erosivity, drought index (SPI), degree-day (3 hr).

Students should produce a final global report comparing two stations across Europe (see tutorship activities)

Visiting Professor Profile
Full Professor
PhD on Geography
Research focused on climate, climate change and climate and erosion processes. Precipitation variability, spatial analysis, and dynamical processes on ecosystems.

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