UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Physical Geography

2021-2-E3201Q090-E3201Q086M

Aims

At the end of this teaching the student will:
- know and remember the basic principles of Physical Geography and Geomorphology;
- recognize, interpret and classify the main landforms, agents, geomorphological processes and analyze the factors that control them.

At the end of this teaching the student will know how:
- to choose the most useful basic tools and methods for geomorphological surveys and creating topographic profiles and simple geomorphological sketch maps.

At the end of the course the student will be able to formulate an opinion:
- on the correct application of the knowledge acquired during the course for carrying out geomorphological field survey activities;
- on the quality and coherency of the geomorphological data he collected, based on their control and discussion;

At the end of the course the student must know how:
- to prepare and perform a presentation of the results of his field surveys and mapping activities;
- to communicate some final remarks on the relationship between Earth Sciences and society, based on the contents of lectures and fieldwork activities.

At the end of this teaching the student will have experienced laboratory teaching and field experience as a methodology for learning Earth Sciences.

The laboratory activities focus specifically on how topographic maps can be used to extract information about the landscape. Both physical and cultural features are often discernible from topographic maps, and the final goal of these laboratory activities is organizing all these information in order to understand the basic geomorphological features and the nature-society or human–environment relationships.

Contents

Course part I - PHYSICAL GEOGRAPHY
Interaction between endogenic and exogenic processes. The agent-landform-process-factor system. Dimensional scales of landforms.
Introduction to tectonic geomorphology.
Introduction to climatic geomorphology: meteo-climatic variables, data collection and analysis.
Weathering: physical and chemical processes. Karst processes. Pedogenetic processes and soils: an introduction.
Mass movements. Slope instability. Landslides.
Fluvial processes and landforms.
Glacial processes and landforms.

Detailed program

1. Geomorphology and Earth Sciences.
1.1 Genesis and evolution of the landforms: basic concepts. 1.2 Branches of Physical Geography and Geomorphology. 1.3 Relationships between Geology and Geomorphology.

2. Weathering and pedogenesis.
2.1 The weathering factors. 2.2 Detrital covers, colluvium, and eluvium. 2.3 Weathered horizons, regolite, and soils. 2.4 Soil development and stratigraphy. 2.5 Palaeosols: geological meaning and dating techniques.

3. Slope denudation.
3.1 Linear, areal, and punctiform erosion. 3.2 Soil creep, solifluction e gelifluction. 3.3 Landslides and their classification.
3.4 Slope deposits. 3.5 Predictive methods of the rocky slope evolution. 3.6 Badlands.

4. Structural landforms.
4.1 Introduction to structural geomorphology. 4.2 Relationships between morphology and geological structures. 4.3 Selective erosion processes. 4.4 Structural surfaces and relief. 4.5 Unadjusted drainage. 4.6 Fold belt and relief types. 4.7 Fault scarps and slopes. 4.8 Land surfaces.

5. Volcanic morphology.
5.1 Mechanisms of emplacement of volcanic products 5.2 Basic volcanic landforms. 5.3 Rocktype-related volcanic edifice classification. 5.4 Morphostructural evolution of volcanoes

6. Fluvial morphology.

6.1 River bed and valley morphology. 6.2 Longitudinal equilibrium profile. 6.3 Morphometry and fluvial patterns. 6.4 Fluvial capture. 6.5 Alluvial deposits. 6.6 Fluvial terraces.

7. Glacial morphology.
7.1 Glacier types and glacial landforms. 7.2 Alimentation and ablation. 7.3 Glacial erosion and transport. 7.4 Fluvial-glacial and morenic deposits. 7.5 Pleistocene glaciations.

8. Karst morphology.
8.1 General features. 8.2 Surface landforms. 8.3 Cave systems. 8.4 Tectonic-karst landforms.

9. Coastal morphology.
9.1 Coastal morphogenetic processes 9.2 Low-sloping coasts. 9.3 High coasts and cliffs. 9.4 Marine terraces.

Cartographic Laboratory

- 1. Slope morphology and processes

- 2. Tectonic and structural forms

- 3. Glacial and Periglacial forms

- 4. Water erosional forms

- 5. Fluvial forms

Prerequisites

None

Teaching form

Lessons 5 cfu (40 hours) following the COVID rules, in frontal and synchronous lessons. All the lessons will be recorded and available on the course web site. The exercise on the geomorphological forms and processes 1 cfu (10 hours), following the COVID rules.

Textbook and teaching resource

I. D. White, S. J. Harrison, D. N. Mottershead, 1992, Environmental Systems (II Edition). Stanley Thornes Eds.

A. Strahler, 2015. Fondamenti di Geografia Fisica, Zanichelli

Federici, Geografia Fisica, UTET

Semester

First semester

Assessment method

If not specify by COVID rules, the exam is made by 2 test, one mid-term and one at the end of the course. The vote is the mean of both the electronic test (Perception, esamionline). The tests are composed by 10 quiz questions and 2 open questions. If one or both the test are not done, the student can make oral exam, at end of the course, on all the program.

The Cartographic Laboratory exam is related to the map interpretation of forms and processes.

The final vote of the Physical Geography module is the weighted mean (respect CFU) of the two exams.

Office hours

Write for appointment at valter.maggi@unimib.it