Course guide
310605 - 310605 - Geomorphology

Unit in charge: Barcelona School of Building Construction
Teaching unit: 751 - DECA - Department of Civil and Environmental Engineering.
Degree: BACHELOR'S DEGREE IN GEOINFORMATION AND GEOMATICS ENGINEERING (Syllabus 2016).
(Compulsory subject).
Academic year: 2023 ECTS Credits: 6.0 Languages: Catalan, Spanish

LECTURER

Coordinating lecturer: Moya Sanchez, Jose
Others: Moya Sanchez, Jose Delgado, Saturio Ruiz Carulla, Roger

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
E3. (ENG) Comprendre i analitzar els problemes de implantació en el terreny de les infraestructures, construccions i edificacions projectades des de l'enginyeria en topografia, analitzar els mateixos i procedir a la seva implantació.
E6. (ENG) Reunir i interpretar informació del terreny i tota aquella relacionada geogràficament i econòmicament amb ell.
E8. (ENG) Planificació, projecte, direcció, execució i gestió de processos de mesura, sistemes d'informació, explotació d'imatges, posicionament i navegació; modelització, representació i visualització de la informació territorial en, sota i sobre la superfície terrestre.

Transversal:
G4. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 1. Planning oral communication, answering questions properly and writing straightforward texts that are spelt correctly and are grammatically coherent.
G5. TEAMWORK - Level 1. Working in a team and making positive contributions once the aims and group and individual responsibilities have been defined. Reaching joint decisions on the strategy to be followed.
G6. EFFECTIVE USE OF INFORMATION RESOURCES - Level 1. Identifying information needs. Using collections, premises and services that are available for designing and executing simple searches that are suited to the topic.

TEACHING METHODOLOGY

The subject is organized in four classroom hours per week, consisting of theory sessions, lab sessions and workshops. The theory sessions (26 h) also enclose short workshops for discussion of questionnaires and workshops of exploration of real cases to illustrate the theoretical concepts.

Some specific and longer workshop sessions (6 h) serve as a synthesis and review of the theory just before each partial exam and also to explain its solution.

The subject has a strong practical component. The labs (Activities 1, 2 and 3; 23 h) are aimed at the direct application of the acquired theoretical knowledge, more precisely at developing the skills of identifying basic landforms, their evolution over time and their cartographic representation.
LEARNING OBJECTIVES OF THE SUBJECT

Upon passing the course, the student will be able to:
· Identify the landscape forms
· Understand the processes leading to these forms
· Interpret simple geomorphological maps (schemes)
· Represent basic landforms on a contour levels map
· Analyze the relief searching for an efficient selection of topographic points
· Search and select information in an efficient way (basic level).
· Synthesize information and communicate results in public (basic level).
· Work in group (basic level).

STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>Hours large group</td>
<td>24,0</td>
<td>16.00</td>
</tr>
<tr>
<td>Hours medium group</td>
<td>36,0</td>
<td>24.00</td>
</tr>
<tr>
<td>Self study</td>
<td>90,0</td>
<td>60.00</td>
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</tbody>
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Total learning time: 150 h

CONTENTS

I. INTRODUCTION TO THE EXTERNAL GEODYNAMICS

Description:
Presentation of the subject. (15 min)

Unit 1. The earth’s surface and its dynamics. (1.75 h)

Unit 2. Basic landform representation. (1 hour)

Unit 3. Types of landforms and their conditioning factors. (1 hour)

Specific objectives:
Knowledge of the large units of relief on the earth’s surface.
Synthetic vision of the different geological processes that operate on our planet.
Knowledge of topographic contour maps and the realization of topographic profiles.
Knowledge of the classification of landforms based on their conditioning factors.

Related activities:
Lab PC1. Introduction to landform recognition on contour level maps. (1 hour)

Related competencies:
CT6. (ENG) Reunir i interpretar informació del terreny i tota aquella relacionada geogràficament i econòmicament amb ell.

Full-or-part-time: 13h
Theory classes: 4h
Practical classes: 1h
Self study: 8h
II. LITHOLOGY AND STRUCTURAL GEOMORPHOLOGY

Description:
Unit 4. Geologic materials. (3 h)

Unit 5. Geological structures. (1 hour)

Unit 6. Structural landscapes. (1 hour)
Passive and active structural control. Landscapes with inherited geological structure: tabular landscapes, monoclinal landscapes, residual landscapes, landscapes in folded areas.

Unit 7. Weathering. (2 h)

Unit 8. Lithological landforms. (2 h)

Specific objectives:
Knowledge of the main characteristics of rocks and their formation processes.
Knowledge of geologic structures.
Knowledge of weathering processes, the resulting geological materials and associated environmental and engineering problems.
Knowledge of the main lithological and structural landforms.

Related activities:
Labs on landscape identification and their cartographic representation. (6 h)
Review workshop (previous 1st theory part) (1.5 h).
Resolution workshop for the first partial theory exam (0.5 h)

Related competencies:
CT3. (ENG) Comprendre i analitzar els problemes de implantació en el terreny de les infraestructures, construccions i edificacions projectades des de l'enginyeria en topografia, analitzar els mateixos i procedir a la seva implantació.
CT6. (ENG) Reunir i interpretar informació del terreny i tota aquella relacionada geogràficament i econòmicament amb ell.
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Full-or-part-time: 51h
Theory classes: 9h
Practical classes: 8h
Guided activities: 3h
Self study: 31h

III. DYNAMIC AND TECTONIC GEOMORPHOLOGY

Description:
Unit 9. Slope process and forms. (2 h)
Hydrological cycle of the slopes. Surface erosion. Slope movements (typology, morphology, velocity and activity)

Unit 10. Glacial geomorphology. (1 hour)

Unit 11. River geomorphology. (2 h)
Unit 12. Coastal geomorphology. (2 h)

Unit 13. Tectonic and volcanic landforms. (2 h)
Faults and landscape: landforms generated by active faults, mountain fronts, failed blocks (horsts and grabens). Volcanism and landscape: types of eruptions and volcanic products, typology of volcanoes, volcanic collapses, movement on slopes of active volcanoes.

Topic 14. Horizontal and vertical movements of the earth's surface. (2 h)

Unit 15. Local displacements of the ground surface and its control (2 h).
Synthesis of geological and geomorphological processes causing displacement of the ground surface. Types of displacement. Introduction to conventional techniques and modern displacement control techniques.

Specific objectives:
Knowledge of the main dynamic geomorphological processes (colluvial, fluvial, glacial and coastal)
Knowledge of the landforms resulting from erosion and sedimentation.
Knowledge of active tectonic and volcanic processes and the resulting landforms.
Knowledge of the horizontal movements of the Earth’s lithosphere. Notions of Plate tectonics, understanding the spatial distribution of tectonic, volcanic and seismic activity on a global scale.
Knowledge and understanding of the formation and destruction of mountain ranges, and of other vertical movements on a regional scale.
Knowledge and understanding of the processes that generate ground displacement and introduction to observation techniques.

Related activities:
1) Labs:
a) Landform photointerpretation of (10 h)
b) Recognition of the evolution of landforms (6 h)

2) Workshops:
a) Theory review workshop (Topics 9 to 15) (2.5 h)
b) Workshop for resolution of the final theory exam (0.5 h)

3) Practical work on a real case (supervised self-activity)

Related competencies:
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CT6. (ENG) Reunir i interpretar informació del terreny i tota aquella relacionada geogràficament i econòmicament amb ell.
CT8. (ENG) Planificació, projecte, direcció, execució i gestió de processos de mesura, sistemes d’informació, explotació d’imatges, posicionament i navegació; modelització, representació i visualització de la informació territorial en, sota i sobre la superfície terrestre.
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Full-or-part-time: 86h
Theory classes: 13h
Practical classes: 18h
Guided activities: 4h
Self study : 51h
GRADING SYSTEM

The evaluation has the following components:
1) Theory exams (value: 40%): two theory partials, each weighing 20% in the course grade.
2) A lab exam on interpreting the morphology of the terrain (weight: 20%)
3) Report of a practical study case, which involves a delivery of a document and an oral presentation (20%) (Activity 4, in group).
4) Deliverables of lab (9% in total). Each lab work will be delivered and evaluated.

At the end of the course there will be an optional re-evaluation exam for those students with a final average mark of less than 5 and greater than 3.5, in which the unapproved contents of the course will be assessed.

Participation and class work will be valued in the final grade.

EXAMINATION RULES.

Attendance at all practices is mandatory, as well as the delivery of the corresponding deliverables of the practices.

The overall grade of "not presented" will be applied in cases of non-delivery of: a) two or more practices, b) an exam or, c) the report of the practical work (either, the deliverable report or the oral presentation).

BIBLIOGRAPHY

Basic:

Complementary:

RESOURCES

Hyperlink: