

26436 - Engineering Geology

Información del Plan Docente

Academic Year	2018/19
Subject	26436 - Engineering Geology
Faculty / School	100 - Facultad de Ciencias
Degree	296 - Degree in Geology
ECTS	5.0
Year	4
Semester	Second semester
Subject Type	Optional
Module	---

1.General information

1.1.Aims of the course

In this course the main objectives are that the prospective student acquires a series of professional competencies in the field of engineering geology, with appreciation of the importance of geology in civil engineering, whilst embracing the ethical compromise of a fully fledged professional geologist.

1.2.Context and importance of this course in the degree

This course is usually undertaken in the fourth year of the degree. Therefore, the students are expected to already have wide geological knowledge, and to be skilled at using the necessary tools -both physical and conceptual- usually fielded in geology.

1.3.Recommendations to take this course

This course is among the courses devoted to those applied aspects of Geology. It requires some familiarity with solving numerical problems, as usual in Physics or Mathematics, and the ability to integrate the studied topics within the wider scope of matters learned in other courses. It is recommended to have successfully passed courses on physics and structural geology in previous years. It is recommended, as well, to assist to all lectures and the rest of activities, to keep a daily routine of work in order to fulfil the deadlines for papers and questionnaires, and to make use of tutorial times.

2.Learning goals

2.1.Competences

Upon completion of this course, students will be able to:

- plan basic geological surveying according the to the engineering goal.
- interpret results from a variety of tests.

26436 - Engineering Geology

- perform basic calculations on surface and underground hydrology for civil engineering.

2.2.Learning goals

To successfully pass this course the student will achieve to...

... know concepts and basic terminology on this discipline

... know geomechanical parameters and usual geomechanical classifications of rock masses

... know the fundamental on geology surveying for civil engineering works

... know the methodology on surface and underground hydrology for engineering applications

2.3.Importance of learning goals

3.Assessment (1st and 2nd call)

3.1.Assessment tasks (description of tasks, marking system and assessment criteria)

1. Assessment activities

Continuous assessment

1. *Questionaries* (running test): at the end of each lecture the student must answer one or more questions related to the topic at hand.

2. *Practicals*: At the end of each practical session the student will either present the results, or answer on a or more questions about it.

3. *Written test*. Near the end of the term there will be a test (about 4h long) with question and/or problems to evaluate the understanding of the course. The student may consult books, course notes, etc.

Global Assessment

Students that failed to follow the course, and those that wish to, have the right to a global evaluation test. It consist on a *written test*, alike the previously described, and an it may include *additional test* where the student will show his/her skills with geophysical instruments.

2. Assessment criteria or Course Grade Distribution

Continuous evaluation mode

26436 - Engineering Geology

grade=(test x 0.7)+(continuous ev. x 0.3), where "continuous ev." referees to (classroom questions + additional problems) x 0.5

Global test

grade=(written test x 0.7)+(additional test x 0.3)

4.Methodology, learning tasks, syllabus and resources

4.1.Methodological overview

This module consists of lectures, practical laboratories, tutorial exercises, may include case histories and coursework exercises.

4.2.Learning tasks

Activity 1. Learning of concepts, descriptions and calculations bases.

Lectures (1.5 ECTS)

Tutorials and seminars (0,5 ECTS)

Activity 2. Learning of procedures

Field work (1.2 ECTS)

Lab work: problems (1.3 ECTS)

Seminars and tutorials (0.5 ECTS)

4.3.Syllabus

Course syllabus

T1. Rock mass characterisation and classification.

T2. Rock slope stability.

T2. Surface hydrology in civil engineering.

T3. Monitoring slopes.

26436 - Engineering Geology

T4. Tunnels.

T5. Dams.

T6. Roads.

T7. Special terrains.

II. PROGRAM OF INSTRUMENTAL AND FIELD PRACTICES

1. Characterization of rock massif (1 day of field). Surroundings of Alpartir (ZARAGOZA), fractured paleozoic massif.
2. Special visits to works and cases (2 days of field). The visit places will take shape taking care of the existing availabilities at the time of accomplishment of the exit of field.

III. PROGRAM OF PRACTICE SESSIONS (CASE STUDIES)

Session 1: Planning of a prospection for a concrete work.
Case: Railcar.

Session 2. Ground classification: properties and objectives. Case: Embankments. Terraplens.

Session 3. Rock slope stability: kinematic analysis.

Session 4. Rock slope stability: dynamic analysis.

Session 5. Hydrometeorological and probabilistic methods applied to the calculation of peak flows.

Session 6. Tests and methods of analysis on special terrains.

4.4. Course planning and calendar

This course is a first semester course. Classes will start the first academic week.

Students can refer to the Faculty of Sciences and Earth Sciences Department websites (<https://ciencias.unizar.es>; <https://cienciatierra.unizar.es/>) for timetable, classroom or assessment dates.

Further information regarding this course (examination, individual or group assignments...), will be provided on the first day of class.

Dates for each field trip will be published at the Earth Sciences Department website.

Tutorials: Office hours will be also provided the first day of class.

This module consists of lectures, field work, practical laboratories, tutorial exercises, case histories and coursework exercises. Key dates:

First official week: kick off of the lectures

Second official week: first practical

4.5. Bibliography and recommended resources