

28704 - Geological engineering

Syllabus Information

Academic year: 2023/24

Subject: 28704 - Geological engineering

Faculty / School: 175 - Escuela Universitaria Politécnica de La Almunia

Degree: 423 - Bachelor's Degree in Civil Engineering

ECTS: 6.0

Year: 1

Semester: First semester

Subject type: Basic Education

Module:

1. General information

The main objective of the subject is to provide students with the basic knowledge of geology, terrain morphology and natural hazards, as well as their application to problems related to engineering projects.

Bearing in mind that Geology is an eminently practical branch of science, its teaching will be approached by considering that the students work as much time as possible on materials (minerals, rocks, maps), a practical dedication that will undoubtedly contribute to consolidate the knowledge received as theoretical information.

The approach and objectives of the course are aligned with the Sustainable Development Goals of the United Nations 2030 Agenda, specifically with the achievement of target 9.1 of Goal 9 and target 11.5 of Goal 11.

2. Learning results

The main learning subjects of this subject are for students to achieve:

- To know the basic concepts of Geology applied to Civil Engineering, including basic knowledge of climatology.
- To know how to make calculations on topographic maps at different scales of representation, as well as to elaborate profiles from flat topographic representations.
- To acquire a minimum basic knowledge of the different types of rocks existing in the Earth's crust, as well as their main compositional and genetic characteristics.

3. Syllabus

THEMATIC BLOCK 1 - BASIC GEOLOGY

- UNIT 1. INTRODUCTION TO GEOLOGY. IMPORTANCE OF GEOLOGY IN CIVIL ENGINEERING UNIT 2. MATTER AND MINERALS
- UNIT 3. IGNEOUS ROCKS
- UNIT 4. SEDIMENTARY ROCKS
- UNIT 5. METAMORPHIC ROCKS
- UNIT 6. CRUSTAL DEFORMATION (FOLDS, FAULTS AND DIACLASES)

THEMATIC BLOCK 2 - INTRODUCTION TO CARTOGRAPHY

- UNIT 7. INTRODUCTION TO CARTOGRAPHY
- UNIT 8. TOPOGRAPHIC MAPS AND MAP OPERATIONS (SCALES AND SLOPES)

THEMATIC BLOCK 3: APPLIED GEOLOGY

- UNIT 9. INTRODUCTION TO ROCK MECHANICS. USES OF ROCKS IN CIVIL ENGINEERING UNIT 10. WATER IN THE FIELD. SURFACE AND SUBWAY HYDROLOGY. CLIMATOLOGY UNIT 11. INTRODUCTION TO SOIL MECHANICS. USES OF SOILS IN CIVIL ENGINEERING UNIT 12. INTRODUCTION TO NATURAL HAZARDS
- TOPIC 13. SEISMIC RISK
- UNIT 14. OTHER RISKS: FLOODING, SLOPE MOVEMENTS, SUBSIDENCE
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4. Academic activities

The teaching methodology of this subject is based on a series of organized and directed classroom activities, in which the basic concepts will be taught and consolidated through the realization of tutored practices, also of a classroom and directed nature. In

addition, in the practical sessions, autonomous activities will be proposed so that the student can approach their resolution in a non-directed way. According to the above, the teaching methodology can be schematized as follows: **A) Presential activities:** They will be developed at the Center, with the distribution in groups of theory and practice according to the chronogram of the degree.

- **Theoretical classes-** Teaching of the theoretical concepts of the subject.
- **Tutored practical sessions:** Presentation of examples, proposal and resolution of problems tutored by the professor, in relation to the theoretical concepts taught in the theoretical classes.

B) Non-attendance activities (work)- Proposal of problems for students to solve independently , with the support of the teacher in tutorials. These activities are an important part of the development autonomous development of students when addressing problems and seeking solutions to them, encouraging critical analysis of the theoretical information provided for its application in each specific practical case. There will be four activities of this type.

5. Assessment system

The proposed evaluation system is of a continuous type, for which it will be necessary to attend at least 80% of the face-to-face activities and will have the following scheme of gradable activities:

Continuous Assessment Exercises. A total of 4 continuous assessment exercises will be proposed (non face-to-face activities), which will be distributed throughout the subject once the corresponding theory topics and exercises have been completed.

These exercises will be similar to those carried out in the classroom, and for their resolution the students will have the assistance of the professor during tutoring hours. This activity will contribute 30% to the final grade of the subject, and all exercises must be handed in.

2º.- Continuous assessment tests: There will be two mandatory written tests in the system of continuous assessment, which will be distributed throughout the subject, one in the middle and one at the end of the term. These tests will include theoretical questions and exercises on the corresponding topics. This activity will contribute globally with 70% to the final grade, and a minimum grade of 4 out of 10 must be obtained in each written test, otherwise the activity will be considered failed.

Prior to the first call, the teacher of the subject will notify each student whether or not they have passed the subject according to the use of the continuous assessment system, based on the sum of the scores obtained in the different activities developed throughout the subject. In case of not passing in this way, the student will have the two calls to do so, but this time in the form of a global assessment test.

As an alternative to the continuous assessment mode, when due to a personal and reasonably justifiable situation, the student cannot adapt to the pace of work required in the continuous assessment system, the student may use the global assessment system, which will be resolved by means of an evaluation test on the dates of the two official exams, in which the student will have to answer the theoretical and practical questions related to the different activities developed in the subject.