ISEL
INSTITUTO SUPERIOR DE ENGENHARIA DE LISBOA

DEC
ÁREA DEPARTAMENTAL DE ENGENHARIA CIVIL

Course file

Study cycle	BACHELOR IN CIVIL ENGINEERING		
Course	ENGINEERING GEOLOGY	Mandatory	☒
		Optional	☐
Course scientific area	CIVIL ENGINEERING	Category	B

Course category: B - Basic; C - Core Engineering; E - Specialization; P - Complementary.

Year: 1st	Semester: 1st		ECTS: 5,5		Total: 149
Contact time	T: 22,5	TP: 22,5	PL: 22,5	S:	OT:

T - Lectures; TP - Theory and practice; PL - Lab Work; S - Seminar; OT - Tutorial Guidance.

Course Director	**Title**	**Position**
Maria Fernanda de Jesus Veloso Leite	Licenciado	Professor Adjunto

Learning objectives (knowledge, skills and competences to be developed by students)

(max. 1000 characters)

The course purpose is that the students make their first contact with Geotechnical Engineering.

OBJECTIVES AND SPECIFIC SKILLS:

a)To provide theoretical and practical bases on geological factors that influence location, design, construction and maintenance of engineering works.

b)Evaluation of geological and geotechnical reports and mapping;

c)Elementary knowledge on site investigation methods using photogeology, direct prospecting, drilling and geophysical surveys;

d)Knowledge on soil and rock investigation procedures, its classification and correlated behaviour;

e)Basic notions on surface and groundwater circulation and its implications on civil engineering works;

f)Knowledge on mass movements assessment and adequate stability solutions;

g)Seismic hazard and site study approach;

h)Basic skills on Portuguese geology and mapping information.

Syllabus (max. 1000 characters)
1 Importance of Geological Sciences on the civil engineering works 2 Mineralogy 3 Petrology and Petrography - magmatic, metamorfic and sedimentary rocks 4 Surface Processes 5 Earth Internal Processes 6 Stratigraphy 7. Portuguese geology 8- Fundamentals on soil and rock mechanics 9. Mass movements 10 Photogeological surveys 11 Site investigation methods=Direct prospecting, drilling, geophysical surveys 12 Hydrogeology 13 Geological and structural maps and profiles – graphic methods TP syllabus=Construction and interpretation of Geological maps and profiles PL syllabus=Identification of common rocks

Demonstration of the consistency between the syllabus and the course objectives (max. 1000 characters)
Objective a) Summarizes all the matters Objective b) Needs the specific knowledge of geological language and the resources found in chapters 10 and 13. Objective c) Accomplished by learning from chapters 2, 3,8,10 and 11. Objective d) Is based on chapters 4, 5, 6, 8, 11 and 12, which give the basis for modelling

geotechnical/geological behaviours

Objective e) Water circulation may affect civil works and projects. Chapter 12, supported by the precedent, shall give detailed information on this matter.

Objective f) Both social and economic aspects of the theme and its relation with construction justify the study of chapter 9.

Objective g) Seismic hazards are spread all over the world. Portugal suffered from historical events. Chapters 5 and 7 approach these matters.

Objective h) Chapter 7 shall give information on the geological resources and potential hazards, in Portugal, both of regional and general extension

This meaning: 1+2+…+13→a+b+…+h

Teaching methodology (evaluation included)

(max. 1000 characters)

Theoretical lessons (1.5h/week), taught with slide projection

PL classes (1.5h/week) designated to identify common rock specimens

TP classes (1.5h/week) involve the analysis and construction of geological maps and profiles, and also photointerpretation

Slides and all kinds of bibliography are given previously to classes

CONTINUOUS ASSESSMENT (75% of all classes' mandatory attendance):

2 practical tests – 1h, 4 rock specimens identification+1.5h maps and profile construction. Each one graded 20, minimum grade of 8 required.

2 theoretical tests – 1.5h/test and a grade of 20/test, required minimum of 8.

4 Reports on the work in TP classes, graded 20.

Final grade = 95% of test average+ 5% of reports – minimum grade 10.

A Mid-term Test can be done if the minimum grade was not reached either in a theoretical or practical part.

EXAMINATION:

Theoretical Part 1.5h, grade 20, minimum grade 8

Practical Part 1h+1.5h, grade 20, minimum grade 8

Final grade = part average, minimum grade 10

Demonstration of the consistency between teaching methodology and the course learning objectives

(max. 3000 characters)

The option giving better results, minding the characteristics of our students, is the lecturing of the theoretical matters.

Teachers make emphasis on the need of scientific attitudes.

Above all, they need to understand which kind of problems they are facing and the multiple variables they have to deal with.

Practice works include the identification of a great number of samples of rock specimens.

They learn how to describe their observations, which contributes for their preparation on making reports.

In TP lessons students use graphical methods to learn and develop skills related to spatial representation, either superficial or deep, of the ground geology.

Continuous assessment makes them follow a gradual approach of all matters and that will lead to the success in learning.

Weekly, prior to the classes, they must answer some questions about previous lectures.

This procedure helps them and the teachers to detect the main difficulties and the learning skills of their pupils.

The assessment follows traditional methods which we consider are still the better for our purposes, considering the internal school overall conditions.

Main Bibliography

(max. 1000 characters)

ASCIUTO, Alessandro; LEITE, Fernanda - “Geologia de Engenharia”. Lisboa : ISEL, Moodle ISEL, 2013/14.

ASCIUTO, Alessandro; LEITE, Fernanda - “Mineralogia e Geologia”. Lisboa : ISEL, Moodle ISEL, 2012.

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TEIXEIRA, Wilson, [e tal.] – "Decifrando a Terra". 2ª ed. São Paulo : Companhia Editora Nacional, 2009. ISBN 978-85-04-01439-6.

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