

<b>POLI</b> ESCOLA SUPERIOR TECNOLOGIA GESTÃO <b>TÉCNICO</b> <b>GUARDA</b>	<b>SUBJECT DESCRIPTION</b>	<b>MODELO</b> PED.013.03
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Course	Topographic Engineering					
Subject	Geomorfology					
Academic year	2023-2024	Curricular year	1st	Study period	1st semester	
Type of subject	Compulsory	Student workload (H)	Total: 112	Contact: 30	ECTS	4
Professor(s)	Ana Maria Morais Caldas Antão					
<input checked="" type="checkbox"/> Area/Group Coordinator <input type="checkbox"/> Head of Department	(select)	José Carlos Almeida				

## PLANNED SUBJECT DESCRIPTION

### 1. LEARNING OBJECTIVES

Acquire knowledge about the Earth's formation and evolution, as well as the study of rocks and the importance of their alteration in the Earth's crust. Know, interpret and analyze different geological maps. Develop ability to prepare and interpret geological maps and cross-sections of them.

### 2. PROGRAMME

#### Theoretical

- Introduction to the concept of geomorphology. The Earth – its structure and constitution.
- Earth structure and origin of the continents. Seismic and volcanic zones of the Earth.
- Geological time and geological evolution of the Earth
- The geological cycles.
- Some concepts about the formation of igneous, metamorphic and sedimentary rocks.
- The external geological cycle and its importance in terrestrial morphogenesis. Rock weathering and its by-products.

#### Practical

- Producing and interpreting topographic and geological cross-sections. Analysis and observation of rocks and minerals.
- Methods of determination of areas in maps.
- Carrying out quick field surveys using a compass. Determination of the magnetic declination in a location.

### 3. COHERENCE BETWEEN PROGRAMME AND OBJECTIVES

To achieve the objectives of the UC, it's proposed an approach based in theoretical concepts and practical applications. This UC enables students to analyze and interpret geological maps, geological profiles and sections, and identify some rock materials.

### 4. MAIN BIBLIOGRAPHY

#### Mandatory

<p><b>POLI</b> ESCOLA SUPERIOR TECNOLOGIA GESTÃO <b>TÉCNICO</b> <b>GUARDA</b></p>	<p><b>SUBJECT DESCRIPTION</b></p>	<p><b>MODELO</b> PED.013.03</p>
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- *Apontamentos do Professor*
- ANTÃO, A.M. (2006) – “Algumas noções e conceitos sobre alteração de rochas”. Instituto Politécnico da Guarda. Coleção de manuais da ESTG. ISSN-1645-8281
- CAMPY, M. E MACAIRE, J.J. (1989) – “Géologie des formations superficielles”. Mason, Paris.
- DERRUAU, M. (1988) – “Geomorfologia”. ARIEL GEOGRAFIA. BARCELONA.
- *Engineering geological maps – a guide to their preparation (1976). The UNESCO Press.*
- GALOPIM DE CARVALHO, A. M. (1997) – *Geologia. Petrogénese e orogénese. Universidade Aberta.*
- GALOPIM DE CARVALHO, A. M. (1997) – *Cristalografia e mineralogia. Universidade Aberta*
- GALOPIM DE CARVALHO, A. M. (2003) – *Geologia Sedimentar. Vol. I - Sedimentogénese. Âncora Editora.*
- GALOPIM DE CARVALHO, A. M. (2002) – *Introdução ao estudo do Magmatismo e das Rochas Magmática. Âncora Editora*
- GALOPIM DE CARVALHO, A. M. (2011) – *Dicionário de Geologia. Âncora Editora*
- HOLMES, A. E HOLMES, D. (1980) – “Geologia Física”. Edição Omega. Barcelona.
- MACEDO, C. E SOUSA, B. (1982) – *Leitura e interpretação de cartas geológicas”. DCT-FCTUC.*
- MELENDEZ, B. e FUSTER, J. (1984) – *Geologia. Paraninfo S.A. Madrid.*
- PEDRAZA ET AL. (1989) – “Formas graníticas de la pedriza”. Agencia del Medio Ambiente. Madrid
- REBELO, J. (1999) – “As cartas geológicas as serviço do desenvolvimento”. Instituto Geológico e Mineiro.
- VELHO, J.L. (2010) – “Mineralogia industrial. Princípios e Aplicações”. Lidel Editora
- Adão Benvindo da Luz & F. A. Lins Ed. (2008) - *Rochas e Minerais Industriais. Rio de Janeiro. CETEM/MCT.*

#### Optional

- WYLLIE, P.J. (1995) – *A Terra. Nova Geologia Global. 3ª Edição. Fundação Calouste Gulbenkian. Lisboa*
- KRAUSKOPF, K. e BEISER, A. (2000) – “The physical Universe”, CAP.14 E 15. McGraw-Hill.
- GALOPIM DE CARVALHO, A. M. (2005) – *Geologia Sedimentar. Vol. II - Sedimentologia. Âncora Editora*

### **5. TEACHING METHODOLOGIES (INCLUDING EVALUATION)**

*Lecture on the main concepts, using audiovisual and Internet resources. Presentation of works done by students. Practical (in the laboratory and in the classroom) and fieldwork exercises with discussion of the results.*

*The evaluation consists in a written test/exam plus works made and presented by the students and presented in the classroom, as well as a quick field mapping using a geological compass. This methodology is valid for continuous and normal evaluation. For the Special evaluation, just a written test is available.*

### **6. COHERENCE BETWEEN TEACHING METHODOLOGIES AND OBJECTIVES**

*The contents of the UC will be transmitted to students via oral exposure, through some basic concepts of geomorphology and geology applied to the course in study. For this it's promoted the bibliographic and web graphical search through the presentation of works by students. The realization of practical applications such as sections and geological profiles, will serve to consolidate the concepts applied to the course. Field classes work as demonstration of some of those notions and concepts, culminating in the development of a field survey done by students.*

### **7. ATTENDANCE**

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*Attendance is strongly recommended especially in practical and field classes, but there is no mandatory minimum to be observed by students.*

## 8. CONTACTS AND OFFICE HOURS

([anantao@ipg.pt](mailto:anantao@ipg.pt), Room 76 and Laboratory of Geotechnics I)

## 9. OTHERS

*It is recommended caution in the practices carried out in the laboratories.*

## DATE

**8 de novembro de 2023**

## SIGNATURES

*Professor(s),*

Professor

*Ana Maria Antão*

(signature)