

**Code: 1694 Geosciences****Degree:** 1<sup>st</sup> cycle - Landscape Architecture**Curricular Year:** 2<sup>nd</sup>**Credits:** 9 ECTS**Language:** Portuguese/English**Prerequisites:** Physics I**Responsible:** Maria Manuela Silva Nunes Reis Abreu**Other lecturer(s):** -**Web Site:** <http://www.isa.utl.pt/home/node/3931>**Semester Course:** 2<sup>nd</sup>**Compulsory****1. Contact hours:****Lectures 56 Practicals/Laboratory 56 Others 14 Total 126****2. Objectives:**

To understand landscape as a dynamic system composed of a group of factors/structures whose characteristics and activities are a result of the internal and external geodynamics. Acquirement of knowledge and competency for the biophysical characterization of the landscape, mainly its geological characterization, delimitation of the maximum infiltration areas, and the genesis and evolution of the relief.

**3. Programme:****Module I: Geology, Hydrogeology**

Principles of Geology. Genesis and classification of magmatic, sedimentary and metamorphic rocks. Geologic Time and Stratigraphic Scale for Portugal. Geology and Lithology of Portugal. Geological Cartography. Structure and tectonic. Hydrogeology - Porosity and permeability of the geologic formations. Aquifers: type, protection (land use), water quality and quantity. Portuguese aquifer systems.

**Module II: Environmental Geochemistry**

Chemical and structural characteristics of the common solid phases in the weathering crust: silicates; oxides and hydroxides; carbonates; sulphates; chlorides. Geochemical behaviour of major and minor elements of in the aqueous solution. Weathering processes and secondary solid phases. Earth climatic regions and weathering processes.

**Module III: Geomorphology**

Relief genesis and evolution and its implications on landscape evolution and conservation. Geological Erosion: Fluvial erosion and surface runoff on landscape morphology. Slope dynamics – mass wasting and its geomorphic significance. Structural Relief. Peneplains and Pediplains genesis. Relief and water flow. Wind and sea erosion - geomorphic processes and geomorphology of coasts. Earth climatic regions and geomorphic processes. Applied Geomorphology: Morphogenetic and Pedogenetic systems; rate Morphogenesis/Pedogenesis and Landscape evolution and conservation - application to Landscape Management

**4. Bibliography:****Main Bibliography**

Abreu MM, 2010. Noções de Geologia e Geologia Geral de Portugal. AEISA  
 Geoquímica – Mineralogia. AEISA  
 Comportamento dos Elementos em Solução Aquosa. AEISA  
 Meteorização. AEISA  
 Estrutura e Tectónica. Acetatos das aulas. AEISA  
 Geomorfologia. Acetatos das aulas. AEISA

Galopim de Carvalho AM, 1996. Geologia. Morfogénese e Sedimentogénese. Univ. Aberta  
 1997. Geologia. Petrogénese e Orogénese. Univ. Aberta

Marques JM, 2007. Hidrogeologia (Apontamentos IST/UTL). AEISA

**Other Bibliography**

Bell, FG, 1998. Environmental Geology. Blackwell Science  
 Elorza, MG, 2008. Geomorfología. Pearson, Prentice Hall  
 Galopim de Carvalho AM, 2002. Introdução ao estudo do Magmatismo e das Rochas Magmáticas. Âncora Editora  
 Huggett, RJ, 2003. Fundamentals of Geomorphology. Routledge Fundamentals of Physical Geography  
 Lutgens FK & Tarbuck EJ, 2003. Essentials of Geology. Prentice Hall  
 McKnight, TL & Hess, D 2008. Physical Geography. A landscape appreciation. Pearson, Prentice Hall

**5. Assessment:****Two tests (Theoretic) + one practical**

A minimum of mark 10/20 in each test.

To exempt the Final Examination is needed a medium mark  $\geq 10/20$ .

One report and oral presentation (2 students/group) about the analysis and interpretation of a Geological Map (scale 1/50000)

**Final Examination:** mark  $\geq 10/20$

**Final Classification:** 85% Tests or final examination (75% Theoretic + 10% practical) + 15% report and oral presentation.

**6. Estimated Workload:**

252	Hours
-----	-------

**7. Last Update:**

9/3/2011
----------