

Code: 1696 Geomatics**Degree:** 1st cycle – Landscape Architecture, Agriculture and Environmental Engineering**Curricular Year:** 2nd**Semester Course:** 2nd**Credits:** 6 ECTS**Compulsory****Language:** Portuguese/English**Prerequisites:** Mathematics I**Responsible:** Manuel Lameiras de Figueiredo Campagnolo**Other lecturer(s):** Rui Marçal Campos Fernando Maria da Graça Corte-Real Mira da Silva Abrantes and Pedro Miguel Ramos Arsénio**Web Site:** <http://www.isa.utl.pt/home/node/3932>**1. Contact hours:****Lectures 28 Praticals/Laboratory 42 Others 14 Total 84****2. Objectives:**

The student is expected to become familiar with data structures for spatial information and spatial operations on those data.

He is expected to be able to solve some simple spatial problems using GIS software.

The student will have to understand introductory concepts of georeferencing systems (national and international), cartography, and explore methods for data acquisition, including GPS.

Finally, the student will have to learn to download and preprocess remote sensing data, to interpret that data and to integrate it with other sources of spatial information.

3. Programme:**I - Geographic Information Systems**

Data structures: raster and vector.

Map creation.

Spatial operations.

Introduction to spatial analysis.

Data editing.

II - Data collection and Cartography

Spatial referencing systems.

Conversion between coordinate systems.

Basic notions of cartography (scale and projections).

Topographic maps and digital terrain models (DTMs – raster, vectorial, and TIN).

Operations over topographic maps and DTMs: calculation of slopes, aspect, viewshed, areas and volumes.

Basic notions of photo interpretation.

GPS, data collection and storing.

III - Remote Sensing

Basic principles.

Remote sensing platforms and sensors.

Pre-processing of remotely-sensed data. Introduction to image analysis.

Image transforms and vegetation indexes.

4. Bibliography:**Main Bibliography**See: <http://www.isa.utl.pt/dm/geomat/geomat/>**5. Assessment:**

Project (realized in groups of up to 4 students) followed by a mandatory individual discussion (6/20).

Final exam (14/20).

Only students that participate in at least 75% of course work and discuss they projects are eligible to do the final exam.

Course approval: min. 6 on the final exam and min. 10 on total.

6. Estimated Workload:

168 Hours

7. Last Update:

25/2/2011