Code: 1755 **Water Resources**
Degree: 1st cycle – Agriculture; Forestry and Natural Resources
Curricular Year: 3rd **Semester Course: 1st**
Credits: 6 ECTS **Compulsory**
Language: Portuguese/English
Responsible: José Luís Monteiro Teixeira
Other lecturer(s): Jorge Manuel Martins Soares David
Web Site: http://www.isa.utl.pt/home/node/4013

1. Contact hours:
Lecture/Practicals 70 **Others** 14 **Total** 84

2. Objectives:

Acquisition of skills to understand processes on water issues and to evaluate water fluxes and water availability at the plot and catchment scales, under different vegetation types, aiming at efficient water management.

3. Programme:

I (common to Agriculture and Forests)
Water balance at the watershed level
- The watershed.
- Definition and characterization of the water balance components: precipitation, evapotranspiration and streamflow.
- Evapotranspiration: transpiration, interception loss. Influence of vegetation type (forests/short vegetation).
- Streamflow: annual water yield and extreme flows (floods and low flows). Influences of vegetation type on streamflow. Estimation of flood peak discharge. Catchment streamflow and downstream water needs (urban supply, industry and irrigation).

II (common to Agriculture and Forests)
Water policy and legislation on water, at the Portuguese and European levels. The EU water policy. Water resources management at the local, regional and national levels. Water resources planning within the national policy framework.

III (Agriculture)
- Water use in agricultural crops. Irrigation needs.
- Irrigation systems.
- Management and evaluation of irrigation systems.

III (Forests)
- Forests and climate: influence of forests on the radiation balance and on rainfall, at micro and macro space scales.
- Ecohydrology of forest ecosystems: hydraulics in the root-leaf flow path, water sources to trees- the root system, hydraulic failure (embolism and cavitation).
- Water erosion: sheet and rill erosion, and gully erosion. Control techniques for sheet and rill erosion. Control techniques for gully erosion (Torrent control). Erosion and vegetation type.

4. Bibliography:

Main Bibliography
Copies of powerpoints and notes from lectures.

Other Bibliography
Book chapters and technical and scientific papers, updated each year.

5. Assessment:

Partial evaluation tests, each 5 weeks.

6. Estimated Workload: 168 Hours

7. Last Update: 8/7/2010