

Code: 1700 Hydraulics**Degree:** 2nd cycle – Agriculture; Viticulture and Oenology**Curricular Year:** 1st**Semester Course:** 1st**Credits:** 6 ECTS**Compulsory** (Agriculture)**Language:** Portuguese/English**Optional** (Viticulture and Oenology)**Responsible:** Manuel António Tabuada**Other lecturer(s):** -**Web Site:** <http://www.isa.utl.pt/home/node/3782>**1. Contact hours:****Lectures 35 Lecture/Practicals 35 Others 14 Total 84****2. Objectives:**

To give the students a basic knowledge on incompressible fluid mechanics and turbo machines.

3. Programme:

- Properties of fluids.
- Hydrostatics: hydrostatic pressure distribution, application to manometer, hydrostatic forces on flat and curved surfaces, hydrostatic forces in layered fluids.
- Kinematics of fluids: streamlines, stream function, trajectories, steady and unsteady flows.
- Dynamics of fluid flows: the Bernoulli equation for an ideal fluid flows and for a real fluid flows.
- Flow of incompressible fluids in pipelines: total head loss and local losses.
- Hydraulic machines and pump-pipeline systems
- Steady flow in open channels.
- Classification of flow profile.
- Hydraulic jump.
- Orifices and weirs

4. Bibliography:**Main Bibliography**

António Quintela, 1981 – Hidráulica. Fundação Calouste Gulbenkian
Armando Lencastre, 1991 - Hidráulica Geral. Edição do Autor. Lisboa

Other Bibliography

Richard French, 1986 - Open Channel Hydraulics - McGrawHill

5. Assessment:

Final examination

6. Estimated Workload:

168	Hours
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7. Last Update:

15/7/2010
