

Code: 1587 Energy Systems**Degree:** 2nd cycle – Bioenergy Systems Engineering**Curricular Year:** 1st**Semester Course:** 2nd**Credits:** 6 ECTS**Compulsory****Language:** Portuguese/English**Responsible:** Miguel Centeno da Costa Ferreira Brito (FC/UL)**Other lecturer(s):** -**Web Site:** <http://www.isa.utl.pt/home/node/3922>**1. Contact hours:****Lectures 30 Practicals/Laboratory 40 Others 14 Total 84****2. Objectives:**

The main objective of this course is the introduction to concepts required to understand the new paradigm of energy systems, in particular regarding the distributed nature of electricity and heat generation. Emphasis will focus on resources, technologies and costs associated to the production of electricity and heat and how the different approaches may be optimally integrated together, in particular in a scenario driven by the electric car.

3. Programme:

1. Supply (resources, technologies, costs)
 - 1.1 Solar thermal
 - 1.2 Hydropower
 - 1.3 Wind energy
 - 1.4 Solar photovoltaics
 - 1.5 Biomass
 - 1.6 Electric grid
2. Demand
 - 2.1 Electric power
 - 2.2 Heat power
 - 2.3 Transports
3. Energy systems
 - 3.1 Demand conditioning
 - 3.2 Scenarios for energy systems

4. Bibliography:**Main Bibliography**

Sorensen, Renewable Energies, 3rd Edition, 2004, Elsevier

5. Assessment:

In class discussion (each student will make 3 presentations on the topics described in the course program) and written final document.

6. Estimated Workload:

168	Hours
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7. Last Update:

21/7/2010
