**Code: 1594** **Applied Microbiology and Biochemistry**
**Degree:** 2nd cycle – Bioenergy Systems Engineering
**Curricular Year: 1st** **Semester Course: 1st**
**Credits: 6 ECTS** **Optional**
**Language:** Portuguese/English
**Responsible:** Maria da Conceição da Silva Loureiro Dias
**Other lecturer(s):** Maria Luísa Louro Martins and Miguel Pedro de Freitas Barbosa Mourato
**Web Site:** http://www.isa.utl.pt/home/node/3929

**1. Contact hours:**
**Lectures** 48 **Lecture/Practicals** 6 **Praticals/Laboratory** 16 **Others** 14 **Total** 84

**2. Objectives:**

To learn the microbiological and biochemical bases of the processes involved in bioenergetic systems

**3. Programme:**

Biomass, biopolymers. Enzymatic hydrolysis. Enzymes and their regulation. Microbial growth parameters. Notions of microbial continuous culture. Alcoholic fermentation and its regulation. Assessment of the activity of glycolytic enzymes. Ethanol from starch and sugar.. Ethanol from lignocellulosic materials (Bacteria, "natural" yeasts, genetically modified Saccharomyces cerevisiae). Tolerance to ethanol. Selection of tolerant yeast strains.. Energetic aspects of metabolism.. Production of methane. Biorefinaries. Production of methanol. Oil recovery by microorganisms. Production of butanol. Production of hydrogen.. Production of electricity by bacteria. Energetic use of fat materials. Biodiesel and other bio fuels.

**4. Bibliography:**

**Main Bibliography**

Bioenergy. 2008. J. Wall, C.S. Harwood, A.L. Demain, ASM Press.
L.P. Wackett. 2008. Microbial-based motor fuels: science and technology. Microbial Biotechnology, 1, 211-225

**Other Bibliography**

Microbial Energy Conversion, A report from the American Academy of Microbiology, 2006
M L. Wald. Is ethanol for the long haul?, Scientific American, Jan 2007, 42-49.

**5. Assessment:**

2 tests, 2 seminars

**6.** Estimated Workload: 168 Hours

**7.** Last Update: 21/7/2010