Code: 1774 **Applied Thermodynamics**
Degree: 1st cycle – Environmental Engineering
Curricular Year: 3rd **Semester Course: 1st**
Credits: 6 ECTS **Compulsory**
Language: Portuguese/English
Responsible: Elizabeth da Costa Neves Fernandes d'Almeida Duarte
Other lecturer(s): Olívio Godinho Patrício
Web Site: http://www.isa.utl.pt/home/node/4005

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

2. Objectives:

To prepare tomorrow's engineer to have a clear understanding and firm grasp of the basic principles of Applied Thermodynamics in order to understand, formulate, and interpret results of even the most complex problems. To encourage creative student's thinking and developing a deeper understanding of the subject matter making learning much easier.

3. Programme:

Contents:
1. Basic Concepts of Thermodynamics
2. Properties of Pure Substances
3. The first Law of Thermodynamics: Closed Systems
4. The first Law of Thermodynamics: Control Volumes
5. The Second Law of Thermodynamics
6. Entropy
7. Second-Law Analysis of Engineering Systems
8. Gas Power Cycles
9. Combined Power Cycles
10. Refrigeration Cycles
11. Gas Mixtures
12. Refrigeration systems and air-conditioning
13. Combustion Chemical Reactions

4. Bibliography:

Main Bibliography

E: Duarte (2000). Manual de Termodinâmica Aplicada à Engenharia Agro-Industrial. Ed. AEISA
E. Duarte (1999). Termodinâmica – Problemas e Aplicações. Ed. AEISA
Y.A.Çengel, M.A.Boles (1997). Thermodynamics – An Engineering Approach. Ed. McGraw-Hill, Inc.

Other Bibliography

H.N.Shapiro, M.J. Moran (1988). Fundamentals of Engineering Thermodynamics. Ed. Wiley, New York.
B.H.Weber, D.J.Depew, J.D.Smith (1988). Entropy, Information and Evolution. Braford Books, MIT Press, Cambridge Mass.

5. Assessment:

Continuous assessment through midterm tests, emphasizing the understanding of the principals of the topics lectures and solving questions applied to environmental problems.
Written final examination.

6. Estimated Workload: 168 Hours
7. Last Update: 13/7/2010