COURSE ID SHEET

Course No.	**5170**	**NTUA**					
Semester:	**8,10**	Core		Elective		Specialization	**X**

Title: **SUSTAINABLE MANAGEMENT OF ENERGY SYSTEMS**

Aim:

The aim of the course is to familiarize students with the basic principles and methods of energy saving, and more specifically to: (a) develop the basic tools of energy and exergy analysis of physical and chemical processes and their application in power and steam generation systems (production, distribution, use, saving), (b) study the basic cogeneration systems (c) study industrial refrigeration and air conditioning, (d) introduce to the use of renewable energy in industry.

Content:

- Energy needs in industry - Energy optimization principles
- Energy Conservation Principle Applications - Energy Quality - Entropy
- Exergy, Exergy Balance - Major categories of irreversible processes
- Energy and exergy analysis of basic and complex power cycles - Rankine Cycle with superheater and reheater - Regenerative vapor power cycle.
- Energy / exergy analysis of heat transfer systems
- Steam production - Steam boilers
- Cogeneration
- Cooling cycles

Textbook:

M.Moran, H.Shapiro, D.Boettner, M.Bailey, Principles of Engineering Thermodynamics, 8th Edition, Wiley, 2015.

Hours per semester:

LECTURES	**24**	EXERCISES	-	LABORA-TORY	**36**	HOME-WORK	**115**	**TOTAL HOURS: 175**

Student performance/ evaluation:

The evaluation of the students will be done through:

- A Final (written) Examination (FE), and
- Exercises (E).

The Final Grade results as follows: Final Grade = 0.5 x (FE) + 0.5 x (E)