UNIVERSITY of NICOSIA

Course Syllabus

Course Code	Course Title	ECTS Credits
MENG-482	Energy Conversion Systems	6
Prerequisites	**Department**	**Semester**
MENG-262	Engineering	Fall, Spring
Type of Course	**Field**	**Language of Instruction**
Elective	Engineering	English
Level of Course	**Lecturer(s)**	**Year of Study**
1st Cycle	Dr Constantinos Charalambous	4th
Mode of Delivery	**Work Placement**	**Co-requisites**
Face-to-face	N/A	None

Course Objectives:

The main objective of the course is to critically examine the technology of energy systems that will be acceptable in a world faced with global warming, local pollution, and declining supplies of oil. The focus is on renewable energy sources (wind, solar, biomass), but other non-carbon emitting sources (nuclear) and reduced carbon sources (co-generative gas turbine plants, fuel cells) are also studied. Both the devices and the overall systems are analyzed.

Learning Outcomes:

After completion of the course students are expected to:

- Become proficient in engineering calculations of the performance and preliminary design of various energy conversion systems.
- Become familiar with the physics of the environmental issues, including the greenhouse effect and global climate change.
- Become adept in the comparative analysis of various energy conversion systems. The comparisons will include cost, social acceptability as well as environmental consequences.
- Be able to apply engineering analysis techniques to the emerging energy technologies of the 21 st century (e.g. wind turbines, combined cycle power plants).
- Understand the context in which the design of energy systems takes place.

Course Content:

- This course provides fundamentals of thermodynamics, chemistry, and transport physics applied to energy conversion systems.
- Analysis of energy conversion and storage in thermal, mechanical, nuclear, chemical, and electrochemical processes in power systems, with emphasis on efficiency, performance and environmental impact.
- Topics include fossil and nuclear power systems, solar energy, wind energy, geothermal energy, biomass energy, and fuel cell systems.

Learning Activities and Teaching Methods:

Lectures, in-class examples and exercises.

Assessment Methods:

Homework/discussion on Moodle, coursework midterm exams, final exam.

Required Textbooks / Readings:

Title	Author(s)	Publisher	Year	ISBN
Energy Systems Engineering	F.M. Vanek, L.D Albright and Largus Angenent	Second Edition, McGraw-Hill, Inc	2012	9780071787789
Geothermal Energy: Renewable Energy and the Environment	William E. Glassley	Second Edition, CRC Press	2014	9781482221749

Recommended Textbooks / Readings:

Title	Author(s)	Publisher	Year	ISBN
Energy Conversion	K. Weston	EBook	2012	0073104639
Thermodynamics: An Engineering Approach 8th Edition	Yunus A. Cengel and Michael A. Boles	McGraw-Hill	2015	978-0073398174