AEEE466 - Sustainable Energy II

Course Title	Sustainable Energy II				
Course Code	AEEE466				
Course Type	Technical Elective				
Level	BSc (Level 1)				
Year / Semester	4th				
Teacher's Name	Dr Alexis Polycarpou				
ECTS	6	Lectures / week	3	Laboratories/week	0
Course Purpose	The aim of the course is to introduce students to the concepts and principles of energy efficiency, used for the design, application, evaluation and development of household buildings. energy saving technologies are also described. Particular emphasis is given to the development of an understanding of the various parameters involved in the calculation of energy efficiency and their implementation in the energy efficiency calculation software..				
Learning Outcomes	By the end of the course, students must be able to: 1. Understand the main principles underlying the field of material Energy performance and also having a critical awareness of the wider context of energy efficient systems. 2. Apply the concepts of energy conservation technologies at distribution level. 3. Evaluate the legal structure surrounding building energy efficiency in Cyprus according to the latest directions of the ministry of commerce industry and tourism, energy service. 4. Evaluate all required parameters for energy efficiency simulations using ISBEM software and calculate the impact of proposed energy saving techniques on the total consumption of a case project.				
Prerequisites	None		Corequisites	None	
Course Content	• Energy saving technologies, simple steps towards energy saving, monitoring systems, voltage optimization, power factor correction, Electricity Authority tariff selection. • Definition of thermal energy efficiency parameters and Minimum demands, material U-values, thermal resistivity, heat capacity, effect of parameters on Active power consumption. • Energy data collection, structure and gaps, electrical installation parameters, mechanical Installation parameters. • Energy efficiency legislation for buildings, Introduction to current legislation, qualification of Expert Technical Advisors, energy efficiency certificate, required documentation. • ISBEM software, software familiarization, calculation and insertion of required data in software, energy consumption calculation, improvement suggestions based on documented energy benefits.				

Teaching Methodology	Students are taught the course through lectures (3 hours per week) in classrooms or computer labs, by means of traditional tools or using computer demonstration. Auditory exercises, where examples regarding matter represented at the lectures, are solved and further, questions related to particular open-ended topic issues are compiled by the students and answered, during the lecture or assigned as homework. Topic notes are compiled by students, during the lecture which serve to cover the main issues under consideration. Students are also advised to use the subject's textbook or reference books for further reading and practice in solving related exercises. Tutorial problems are also submitted as homework and these are solved during lectures or privately during lecturer's office hours. Students are prepared for final exam, by revision on the matter taught, problem solving and concept testing and are also trained to be able to deal with time constraints and revision timetable. The final assessment of the students is formative and is assured to comply with the subject's expected learning outcomes and the quality of the course.
Bibliography	**<u>Textbooks:</u>** • Cyprus Ministry of commerce industry and tourism, energy service, thermal insulation guide for buildings, Γ.Τ.Π. 290/2010 - 5.000 ISBN 978-9963-38-760. • CYS EN ISO 13790 Energy performance of buildings-Calculation of energy use for space heating and cooling. • CYS EN ISO 10077-1:2006 Thermal performance of windows, doors and shutters-calculation of thermal transmittance. **<u>References:</u>** • Peter Gevorkian, Sustainable energy systems engineering: the complete green building design resource, McGraw-Hill, ISBN: 978-0071473590, 2007.
Assessment	The Students are assessed via continuous assessment throughout the duration of the Semester, which forms the Coursework grade and the final written exam. The coursework and the final exam grades are weighted 40% and 60%, respectively, and compose the final grade of the course. Mid-term written exams are used for the continuous assessment of the students, Group research project is also used. The assessment weight, date and time of each type of continuous assessment is being set at the beginning of the semester via the course outline. An indicative weighted continuous assessment of the course is shown below: • Mid-Term written exams 70% • Group Research project 30% Students are prepared for final exam, by revision on the matter taught, problem solving and concept testing and are also trained to be able to deal with time constrains and revision timetable. The final assessment of the students is formative and summative and is assured to comply with the subject's expected learning outcomes and the quality of the course.
Language	**English**