Course Title	Design and Installation of Photovoltaic Systems				
Course Code	ETECH 250				
Course Type	Compulsory				
Level	First Cycle				
Year / Semester	Second Year / Spring				
Teacher's Name	Yiakoumi Iacovos				
ECTS	6	Lectures / week	1 ½	Laboratories / week	1 ½
Course Purpose and Objectives	The main objectives of the course are to: • Introduce the main components of a photovoltaic system • Outline the design procedure of a grid-connected or autonomous solar system • Explain how the sizing of batteries, inverters, regulators, cables, etc is done • Explain the installation and positioning of PV panels • Provide knowledge on system protection and selection of components • Provide knowledge on system wiring, installation, testing, troubleshooting, and commissioning of a PV system • Provide information on system maintenance and periodic checkup • Introduce students to design software • Introduce the students to economic assessment and cost analysis based on national grant schemes and government incentives				
Learning Outcomes	After completion of the course students are expected to: • Design and install grid-connected and autonomous PV systems • Use available software to properly size system components and cables • Perform testing and troubleshooting of a photovoltaic installation • Perform periodic checkup and maintenance to an installed PV system • Install PV system for caravans, boats, cars, etc. • Perform economic assessment and cost analysis for the installed PV system • Be aware of national grant schemes and government incentives related to solar energy				
Prerequisites	None		Required		None
Course Content	• Principles of solar energy and the photovoltaic phenomenon • Types of solar power systems (grid-connected, stand-alone, etc) • Components of a solar electric system (inverter, controller/regulator, batteries, solar panels, protection devices, cables, etc.)				

	• Design process (calculations for power consumption, system efficiencies, voltage drop, cable resistance, days of autonomy, panel area, panel orientation, energy production, etc.) • Sizing of batteries, inverter, regulator, cables, panels • Positioning of panels, inverter, batteries, and regulator • Surveillance of the installation site • Selection of components and costing • System protection design (DC/AC disconnect, ground fault protection, earthing and bonding, etc.) • System wiring (panels, inverter, batteries etc) • Installation, testing, troubleshooting, and commissioning • Solar system maintenance • Economic assessment • Simulation sizing/design software (e.g. by SMA) • National grant schemes for the utilization of renewable energies (e.g. incentives) • Other solar applications (e.g. caravans, street lights, boats, solar cars, etc) • Energy efficient household devices
Teaching Methodology	Lectures, in-class examples, exercises, practical.
Bibliography	<u>Compulsory</u> • Solar Electricity Handbook 2011: A Simple Practical Guide to Solar Energy - Designing and Installing Photovoltaic Solar Electric Systems (2011), Michael Boxwell, Greenstream Publishing, ISBN: 978-1-907670-04-6 • Lecturers notes.
Assessment	Homework: 10% Participation: 10% Laboratory: 20% Mid Term: 20% Final Exam: 40%
Language	Greek