UNIVERSITY of NICOSIA

Course Code	Course Title	ECTS Credits
ECE-563	Smart Power Grid Management	8
Department	**Semester**	**Prerequisites**
Engineering	Fall, Spring	None
Type of Course	**Field**	**Language of Instruction**
Elective	Engineering	English
Level of Course	**Year of Study**	**Lecturer(s)**
2nd Cycle	1st	Dr Stylianos Hirodontis
Mode of Delivery	**Work Placement**	**Co-requisites**
Face-to-face	N/A	None

Objectives of the Course:

The main objectives of the course are to:

- Introduce students to cutting-edge technologies for connecting the power infrastructure to modern computerized communications networks
- Provide solid knowledge on standardization, applications, protocols, automation, architecture, and management of grids
- Develop the tools for quantitative and qualitative performance analysis of bidirectional communication, automation, renewable energy integration, and wireless sensor networks
- Provide solid technical knowledge on renewable energy sources and their integration into smart grids

Learning Outcomes:

After completion of the course students are expected to:

- Explain the main characteristics, differences, advantages, and disadvantages of smart grid networks
- Analyze and evaluate the performance and efficiency of smart grids and microgrids
- Evaluate the Multiple distributed smart microgrids with a self-autonomous, energy harvesting wireless sensor network
- Perform calculations for Wireless sensor networks for consumer applications in the smart grid
- Describe low-voltage, DC grid–powered LED lighting system with smart ambient sensor control for energy conservation in green building

Course Contents:

- Demand-side energy management
- The modernization of distribution automation featuring intelligent FDIR and volt-variation optimization

- Advanced asset management
- Wide-area early warning systems
- The integration of renewable energy sources into smart grids
- The micro-grid in the electric system transformation
- Enhancing the integration of renewable in radial distribution networks through smart links
- Voltage-based control of DG units and active loads in smart micro-grids
- Electric vehicles in a smart grid environment
- Low-voltage, DC grid–powered LED lighting system with smart ambient sensor control for energy conservation in green building
- Multiple distributed smart micro-grids with a self-autonomous, energy harvesting wireless sensor network
- Wireless sensor networks for consumer applications in the smart grid
- ZigBee-based wireless monitoring and control system for smart grids

Learning Activities and Teaching Methods:

Lectures, Projects, Discussion

Assessment Methods:

Homework, Project assignments, exams, final exam.

Required Textbooks/Reading:

Authors	Title	Publisher	Year	ISBN
Krzysztof Iniewski	Smart Grid Infrastructure & Networking	McGraw-Hill	2012	

Recommended Textbooks/Reading:

Authors	Title	Publisher	Year	ISBN
Ekanayake, J., Jenkins, N., Liyanage, K., Jianzhong, W	Smart Grid: Technology and Applications	John Wiley	2012	