

FACULTY OF **ENGINEERING**

DEGREE COURSE: **INDUSTRIAL ENGINEERING BS**

SUBJECT: ENERGY SYSTEMS MANAGEMENT

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OBJECTIVES

The course is aimed at providing the essential knowledge for understanding the management of the most important energy systems, bearing in mind the rapid changes that have affected the energy world and the environment in recent years.

The course consists of three parts:

- 1) Energy markets. In particular, the architecture and main features of the electricity markets is extensively discussed. Then, the energy market of the most important fossil sources (oil, coal and natural gas) is analyzed and the role of the environmental markets presented.
- 2) Distributed power generation and its role in increasing the reliability of supply and reducing the carbon dioxide emissions (focus on the different technologies and the related issues due to the management of such generation systems e.g. smart grid).
- 3) Energy management (both in public and private sectors): analysis of the energy auditing tools used to optimize the management of energy systems.

CONTENTS

Power plants: an overview

Markets for electrical energy

The energy market of fossil fuels: oil, coal and natural gas

Technologies for distributed generation

Distributed power plants: management and network issues

Energy Auditing tools and examples of *Energy Management*

LEARNING OUTCOMES

At the end of this course students will:

- have the essential knowledge for understanding the management of the most important energy systems
- know both the architecture and main features of the most important energy markets and the consequent role of the environmental markets
- know the role of the distributed power generation and the related issues due to the management of such generation systems.

ASSESSMENT

Written exam: multiple choice and open questions

RECOMMENDED TEXTBOOKS

Daniel Kirshen, Goran Strbac, *Fundamentals of Power System Economics*, Wiley & Sons, 2004

Wayne Turner, Steve Doty, *Energy Management Handbook*, Fairmont press, 2006

