

Academic Year: (2022 / 2023)

Review date: 19-05-2022

Department assigned to the subject: Electrical Engineering Department

Coordinating teacher: ALONSO MARTINEZ, MONICA

Type: Compulsory ECTS Credits : 6.0

Year : 1 Semester : 2

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

-Electrical Equipment and Systems

OBJECTIVES

In this subject adequate knowledge of electrical engineering and areas that have application are acquired here.

Students who pass this subject will be able to:

CB6 Possess and understand knowledge that provides a basis or opportunity to be original in the development and / or application of ideas, often in a research context

CB7 That students know how to apply the acquired knowledge and their ability to solve problems in new or little-known environments within broader (or multidisciplinary) contexts related to their area of study

CB8 That students are capable of integrating knowledge and facing the complexity of formulating judgments based on information that, being incomplete or limited, includes reflections on social and ethical responsibilities linked to the application of their knowledge and judgments

CB9 That students know how to communicate their conclusions and the knowledge and ultimate reasons that support them to specialized and non-specialized audiences in a clear and unambiguous way

CB10 That students possess the learning skills that allow them to continue studying in a way that will be largely self-directed or autonomous.

-Know the principles of active smart grids and the integration of renewable energy sources in active distribution networks.

-Know the infrastructure of electrical and communication networks: Power electronics, electrical storage systems.

-Knowledge of the operation and control techniques of active networks: Stability, frequency-power control, voltage control, state estimation.

-Knowledge of AMR automation and measurement systems in smart grids.

-Know the measures of demand management and management of active distribution networks.

-Capabilities to select the most appropriate components for each application within those commercially available.

-Know how to operate smart grids with renewable energy.

- Ability to design smart grid protection and control systems.

DESCRIPTION OF CONTENTS: PROGRAMME

1.- Introduction.

2.- Distributed energy resources: storage facilities and electrical vehicle.

3.- Smart grid management: state estimation, voltage control, demand management.

4.- Micro grids management.

5.- Automation in Smart grids.

6.- Smart grids lab.

5.- Demonstration Projects and Deployment

LEARNING ACTIVITIES AND METHODOLOGY

Lecturer classes and Practical exercises in the laboratory.

Lecturer classes are taught by Professors from Universidad Carlos III de Madrid and professional experts with experience in the industrial field.

ASSESSMENT SYSTEM

Ordinary evaluation:

100% practical work

Extraordinary evaluation:

100% practical work

% end-of-term-examination:	0
% of continuous assessment (assignments, laboratory, practicals...):	10

BASIC BIBLIOGRAPHY

- M. Bollen The Smart Grid. Adoption the Power System to New Challenges, Morgan & Claypool Publishers, 2011