

Academic Year: ( 2019 / 2020 )

Review date: 11-11-2019

Department assigned to the subject: Electrical Engineering Department

Coordinating teacher: SORRENTINO , ELMER

Type: Electives ECTS Credits : 6.0

Year : 4 Semester :

**DESCRIPTION OF CONTENTS: PROGRAMME****PART I**

- Fundamentals of protection practice
- Review of symmetrical components applied to short-circuit calculations
- Protection and control schematic drawings interpretation
- Current transformers
- Voltage transformers
- Overcurrent protections

**PART II**

- Distance protection
- Distance teleprotection schemes
- Line differential protection
- Power transformer protections
- Breaker failure protection

**PART III**

- Fault analysis in Power Systems
- Electrical protections testing (Lab)

**LEARNING ACTIVITIES AND METHODOLOGY**

-Theoretical lectures, doubts solving sessions in reduced groups, individual tutorials and personal work of the student; oriented to the acquisition of theoretical knowledge.

-Analysis and solving of practical problems in reduced groups, laboratory, individual tutorials and personal work of the student oriented to the acquisition of practical skills related to the contents of the subject.

**ASSESSMENT SYSTEM**

Continuous evaluation, based on:

- Written exercises for each of the 3 parts of the subject.

Those students who pass the 3 exercises will be exempt from performing the final exam, however they can perform it if it is their desire with the objective of achieving higher marks.

Those students who fail one or more exercises must perform the final exam.

**% end-of-term-examination:** 60

**% of continuous assessment (assignments, laboratory, practicals...):** 40

**BASIC BIBLIOGRAPHY**

- Iriondo Barrenetxea, A. Protecciones de Sistemas de Potencia, Universidad del País Vasco, 1996
- Montané Sangrá, P. Protecciones en las Instalaciones Eléctricas: Evolución y perspectivas,

MARCOMBO, 1993

- Suarez Creo, Juan M. Protección de Instalaciones y redes eléctricas, Andavira, 2011

#### BASIC ELECTRONIC RESOURCES

- Alstom . Network Protection & Automation Guide: <a

href="http://www.gegridsolutions.com/alstomenergy/grid/products-services/product-catalogue/electrical-grid-new/digital-substation/substation-automation/agile-protection-relays/network-protection-automation-guide-new-edition/index.html" target="\_blank">http://www.gegridsolutions.com/alstomenergy/grid/products-services/product-catalogue/electrical-grid-new/digital-substation/substation-automation/agile-protection-relays/network-protection-automation-guide-new-edition/index.html</a>

- Blackburn, J. L.; Domin, T. J. . Protective Relaying: Principles and Applications:

http://uc3m.summon.serialssolutions.com/#!/search?bookMark=ePnHCXMw42JgAfZbU5mhpykZWwK7WOC9jFxGoEky0E235mwMohrhicGpwcGa0MEQY2NgzrHkgA-OQPicDMIBkNMKgDlAbS5A7T1h5tB0c01xNlDtzTZODfe2MwAdOhDPIpGY2LUAABJjCrr