Computer-aided power system modelling

Academic Year: (2022 / 2023) **Review date: 04-06-2021**

Department assigned to the subject: Electrical Engineering Department

Coordinating teacher: LEDESMA LARREA, PABLO

Type: Electives ECTS Credits : 6.0

Year : Semester :

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Fundamentals of Electrical Engineering

OBJECTIVES

The student will be able to:
- Explain the differences between a electromagnetic transients program and a electromechanical transients program
- Explain the scope of the power system analysis software tool PSS/E
- Enumerate the data needed to solve a power flow
- Use these data to solve a power flow in PSS/E
- Perform a contingency analysis in PSS/E
- Perform a voltage stability analysis in PSS/E
- Perform an optimal power flow in PSS/E
- Enumerate the data needed to simulate a severe perturbation in a power system
- Use these data to execute a dynamic simulation in PSS/E
- Extract relevant information from the output of a dynamic simulation
- Perform these tasks in PSS/E automatically

DESCRIPTION OF CONTENTS: PROGRAMME

- Electromagnetic transient simulation
- Power flow
- Contingency analysis
- Economic dispatch
- Voltage stability
- Optimal power flow
- Electromechanical transient simulation
- Synchronous generator models
- Protections

LEARNING ACTIVITIES AND METHODOLOGY

Classroom sessions, in which the teacher will explain the theoretical contents.

Practical sessions in a computer room. The student will use software tools commonly used by the electric utilities, specially PSS/E. The student will apply the theoretical concepts to practical examples.

ASSESSMENT SYSTEM

The continuous assessment mark is A*T, where
A is the attendance mark
T is the mark of the works performed along the course.

If the grade obtained in the continuous assessment is equal or more than 6 over 10, then it is not necessary to do the end-of-term examination. In this case, the final grade will be that of the continuous assessment.

% end-of-term-examination:	60
% of continuous assessment (assigments, laboratory, practicals…):	40

BASIC BIBLIOGRAPHY

- Grainger, Stevenson Power System Analysis, McGraw-Hill.