

Academic Year/course: 2021/22

66338 - Advanced simulation of power systems with renewable generation

Syllabus Information

Academic Year: 2021/22

Subject: 66338 - Advanced simulation of power systems with renewable generation

Faculty / School: 110 - Escuela de Ingeniería y Arquitectura

Degree: 535 - Master's in Renewable Energies and Energy Efficiency

ECTS: 5.0

Year: 1

Semester: Second semester

Subject Type: Optional

Module:

1. General information

2. Learning goals

3. Assessment (1st and 2nd call)

4. Methodology, learning tasks, syllabus and resources

4.1. Methodological overview

Since this course is divided into two sections, the teaching methodology of each section is selected by the lecturer depending on the pursued objectives. The course planning will be available on the virtual platform Moodle.

All materials are provided in Moodle, with supplementary information for the student who wishes to deepen in specific issues.

4.2. Learning tasks

The course includes the following learning tasks:

- A01 Lectures (25 hours). Presentation of theoretical contents by a faculty or by external experts to all students enrolled in the course. Although it is not a mandatory activity, regular attendance is highly recommended.
- A02 Problem and case studies(13 hours). Solve practical problems and exercises with all the students. Although it is not a mandatory activity, regular attendance is highly recommended.
- A03 Laboratory sessions (12 hours). Students will work actively in groups to solve practical exercises.
- A06 Guided assignments (20 hours). Students will complete assignments, problems and exercises related to concepts seen in laboratory sessions and lectures.
- A07 Autonomous work (50 hours). Students are expected to spend about 50 hours to study theory, solve problems and prepare lab sessions
- A08 Assessment (5 hours).

The indicated hours are for guidance and will be adjusted depending on the academic calendar. At the beginning of the course, lecturers will communicate the schedule of practice sessions, which will be set according to the syllabus and the availability of laboratories and computer rooms.

4.3. Syllabus

The course will address the following topics:

Section I. The finite element method for solving electromagnetic problems

Theory:

- Fundamentals of electromagnetic theory: static problems, low-frequency electrodynamic problems, boundary conditions.

Practice:

- Introduction to 2D and 3D finite element software. Basic examples solution.

Section II. Simulation of power systems

Theory:

- Stability in electric power systems
- Introduction to the simulation of power systems.

Practice:

- Introduction to steady-state simulation. Basic examples solution.
- Introduction to dynamic simulation. Basic examples solution.

4.4. Course planning and calendar

This course is taught in the second semester, three hours per week.

Further information concerning the timetable, assessment dates (deadlines and final test evaluation), and other details regarding this course will be provided on the first day of class and on Moodle.