

66333 - Hydraulic and wind energy

Información del Plan Docente

Academic Year	2017/18
Faculty / School	110 - Escuela de Ingeniería y Arquitectura
Degree	330 - Complementos de formación Máster/Doctorado 535 - Master's in Renewable Energies and Energy Efficiency
ECTS	6.0
Year	XX
Semester	Half-yearly
Subject Type	Compulsory, ENG/Complementos de Formación
Module	---

1.General information

1.1.Introduction

1.2.Recommendations to take this course

1.3.Context and importance of this course in the degree

1.4.Activities and key dates

2.Learning goals

2.1.Learning goals

2.2.Importance of learning goals

3.Aims of the course and competences

3.1.Aims of the course

3.2.Competences

4.Assessment (1st and 2nd call)

4.1.Assessment tasks (description of tasks, marking system and assessment criteria)

5.Methodology, learning tasks, syllabus and resources

5.1.Methodological overview

The development of this course is structured into three main activities: theory sessions, practice sessions and an essay.

In the theory sessions the basic concepts are explained and related to the technical characteristics of the process using short exercises which will be solved in the blackboard as a support to fix the compression of the concepts.

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The practice sessions combine laboratory experiments with computer exercises to study practical examples more complex than the exercises explained in the blackboard, for whose solution some significant calculations are necessary. Moreover, students will visit some installations to see the application of the theoretical concepts and the simulation exercises in the computer sessions.

The essay will focus on the introduction to research. In this work, the student will have to study and analyze a topic assigned by the teacher to draw his/her own conclusions in a concrete way and with a thorough analysis of this topic.

5.2.Learning tasks

The course includes the following learning tasks:

- A01 Lectures (30 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 solving (15 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 (15 hours). Students will work actively in groups to solve practical exercises.
- A06 Guided assignments (24 hours). Students will complete assignments, problems and exercises related to concepts seen in laboratory sessions and lectures.
- A07 Autonomous work (60 hours). Students are expected to spend about 60 hours to study theory, solve problems and prepare lab sessions
- A08 Assessment (6 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.

5.3.Syllabus

The course will address the following topics:

Topic 1. Basic aspects and wind resources analysis

Topic 2. Wind Turbine technology

Topic 3. Construction of wind farms

Topic 4. Operation and maintenance of wind farms: production control

Topic 5. Basic aspects of the hydropower production

Topic 6. Hydraulic concepts and civil engineering

Topic 7. Electromechanical equipment

Topic 8. Design, installation, operation and maintenance

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Topic 9. Financial viability analysis of the wind and hydropower installations: fundamental aspects

Topic 10. Optical dimensioning of embedded systems

5.4. Course planning and calendar

Further information concerning the timetable, classroom, assessment dates and other details regarding this course, will be provided on the first day of class or please refer to

https://eina.unizar.es/estudios/index.php?option=com_content&view=article&id=85&catid=79

5.5. Bibliography and recommended resources

Energía eólica, Autores: Ana Talayero y Enrique Telmo, Edit. Universidad de Zaragoza

Sistemas Eólicos De Producción De Energía Eléctrica Autor : Rodríguez Amenedo, J.L., Editor : Rueda