

## 66333 - Hydraulic and wind energy

### Syllabus Information

**Academic Year:** 2019/20

**Subject:** 66333 - Hydraulic and wind energy

**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:** 330 - First semester

535 - First semester

535 - First semester

535 - First semester

**Subject Type:** 535 - Compulsory

330 - ENG/Complementos de Formación

**Module:** ---

## 1.General information

### 1.1.Aims of the course

### 1.2.Context and importance of this course in the degree

### 1.3.Recommendations to take this course

## 2.Learning goals

### 2.1.Competences

### 2.2.Learning goals

### 2.3.Importance of learning goals

## 3.Assessment (1st and 2nd call)

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

## 4.Methodology, learning tasks, syllabus and resources

### 4.1.Methodological overview

The development of this course is structured into three main activities: theory sessions, practice sessions and the possibility of 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 comprehension of the concepts.

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, there is the possibility that students will visit some installations to see the application of the theoretical concepts and the simulation exercises in the computer sessions.

### 4.2.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.

### **4.3.Syllabus**

The proposed syllabus for this subject is as follows. The order of teaching will depend on the teachers assigned.

Wind part:

Basic aspects  
Wind resource.  
Wind turbines  
Construction of wind farms.  
Operation and maintenance. Economic aspects.  
Integration with other energy sources

Hydraulic part:

Basic aspects of hydroelectric generation.  
Hydraulic concepts and civil works.  
Electromechanical equipment  
Design, installation, operation and maintenance.  
Economic feasibility analysis of the wind and hydraulic installations: fundamental aspects.

### **4.4.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 the information of the EINA web.

### **4.5.Bibliography and recommended resources**

[http://biblos.unizar.es/br/br\\_citas.php?codigo=66333&year=2019](http://biblos.unizar.es/br/br_citas.php?codigo=66333&year=2019)