

Academic Year/course: 2022/23

## 66362 - Biomass energy

### Syllabus Information

**Academic Year:** 2022/23

**Subject:** 66362 - Biomass energy

**Faculty / School:** 110 - Escuela de Ingeniería y Arquitectura

**Degree:** 636 - Master's in Renewable Energies and Energy Efficiency

**ECTS:** 6.0

**Year:** 1

**Semester:** First semester

**Subject Type:** Compulsory

**Module:**

### 1. General information

### 2. Learning goals

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

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

#### 4.1. Methodological overview

The methodology followed in this course is oriented towards achievement of the learning objectives. In theory sessions the basic concepts are explained and related to the technical process characteristics. Short exercises are solved on the board, serving as support to assure understanding of the concepts. In both cases the basic methodology used is the lecture. In the practice sessions, laboratory experiments are combined with computer sessions in which students work in more complex case studies than those presented in theory sessions. In addition, the students conduct an assignment supervised by the teacher, where they apply in a concrete and practical way the concepts presented in class.

#### 4.2. Learning tasks

This is a 6 ECTS course organized as follows:

- A01 Lectures (45 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 (5 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 (10 hours). Students will work actively in groups to solve practical exercises.
- A05 Guided assignments (10 hours). Students will complete assignments, problems and exercises related to concepts seen in laboratory sessions and lectures.
- A07 Autonomous work (74 hours). Students are expected to spend about 100 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 course will address the following topics:

1. General perspective and state of art. Definitions.
2. Dry waste biomass and energy crops. Resource evaluation.
3. Biomass pretreatment processes for energy use. Drying, milling, pelletizing. Biomass storing and handling systems.
4. Thermochemical transformations of biomass. Combustion, Gasification, Pyrolysis. Technologies and installations.
5. Energy from wet waste biomass
6. Economic, legislative and environmental aspects of biomass systems.

### **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.