

**Información del Plan Docente**

<b>Academic Year</b>	2018/19
<b>Subject</b>	66210 - Advanced Separation Processes
<b>Faculty / School</b>	110 - Escuela de Ingeniería y Arquitectura
<b>Degree</b>	531 - Master's in Chemical Engineering
<b>ECTS</b>	6.0
<b>Year</b>	1
<b>Semester</b>	First semester
<b>Subject Type</b>	Compulsory
<b>Module</b>	---

**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 methodology followed in this course is oriented towards achievement of the learning objectives. A wide range of teaching and learning tasks are implemented, such as

- **Lectures.** They will provide the theoretical basis that makes up the course syllabus as well as solutions for key exercises.
- **Practice sessions.** Problem-solving, case studies, and practical work constitute an effective complement to lectures. The combination of both practice and theory sessions will provide the student with a more applied and critical point of view.
- **Essays.** They will be the most important part of the evaluation system in which the students will establish the basis of their academic success.

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Students are expected to participate actively in the class throughout the semester.

### 4.2. Learning tasks

The course includes the following learning tasks:

- **Lectures.** (30 hours). The theoretical basis of the course contents will be explained and analyzed and key problem examples will be solved.
- **Problem-solving sessions** (15 hours). The students will solve problems supervised by the lecturers. Problems and/or case studies will be related to the theoretical aspects explained during the lectures.
- **Practice sessions** (12 hours). Students will do advanced search and solve complex problems. These sessions will take place at the end of each topic. The lecturers will assist the students at the beginning of the different exercises and these exercises will be finished by the students (either individually or in groups of 2-3 people, depending on the difficulty, essay extension, available facilities, etc.). Most of these sessions will require a deliverable (essay) to be revised and assessed by the teacher and some oral presentations.
- **Special sessions** (3 hours). The visit to a company, expert's talks, thematic workshops, discussions with guest professional, etc.
- **Study** (64 hours). The student is strongly recommended to carry out individual study in a continuous manner during the semester.
- **Autonomous work** (20 hours). The preparation of practice sessions as well as individual oral presentations.
- **Assessment** (6 hours). Students will take a final examination with supporting material (books and notes). The students will show, individually, the acquired theoretical and practical skills, as well as their ability to develop critical thinking in specific questions related to the different subjects.

### 4.3. Syllabus

The course will address the following topics:

**Topic 1.** General introduction (1 h).

**Topic 2.** Operations with solids. General concepts and solids conditioning (5 h).

**Topic 3.** Fixed beds and fluidized beds (8 h).

**Topic 4.** Mechanical separation of solids. Filtration (5 h).

**Topic 5.** Separation of fluids by adsorption (6 h).

**Topic 6.** Membrane separation processes (7 h).

**Topic 7.** Drying of solids (6 h).

**Topic 8.** Evaporation (5 h).

**Topic 9.** Crystallization (6 h).

**Topic 10.** Process intensification (4 h).

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**Topic 11.** Selection of separation processes (7 h).

### **4.4.Course planning and calendar**

Further information concerning the timetable, classroom, office hours, assessment dates and other details regarding this course, will be provided on the first day of class or please refer to the EINA website (<http://eina.unizar.es>).

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