Universidad Zaragoza
1542

Year : 2018/19

29931 - Industrial Chemistry

Syllabus Information

Academic Year:	2018/19
Subject:	29931 - Industrial Chemistry
Faculty / School:	110 -
Degree:	435 - Bachelor's Degree in Chemical Engineering
ECTS:	6.0
Year:	4
Semester:	First semester
Subject Type:	Compulsory
Module:	---

General information

Aims of the course

Context and importance of this course in the degree

Recommendations to take this course

Learning goals

Competences

Learning goals

Importance of learning goals

Assessment (1st and 2nd call)

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

Methodology, learning tasks, syllabus and resources

Methodological overview

The learning process that is designed for this course is based on the following:

For the design of the learning process it has taken into account that this is a subject of theoretical and practical nature.

Therefore, the learning process takes place on several levels: theory classes, classes of problems, tutored projects and a final exam. It also should be added the individual study effort by the student

Learning tasks

The program offered to students to assist in achieving the expected results includes the following activities...

Classroom activities (60 hours), distributed in:

- Theoretical lectures (40 hours). There will be sessions of exposure, explanation and discussion of the theoretical basis that will allow to analyze and integrate knowledge and to know, critically, the most important industrial chemical processes. The methodology will consist of case studies of chemical processes.
- Classes of problems (20 hours). Problems of mass and energy balances, both in steady and unsteady state will be solved. The aim is to allow the student to achieve the learning outcome number 3.

Tutored works (20 hours out of classroom time). During the course, students will be proposed carrying out work for implementing the concepts studied. These works will be delivered in the form of documents to be corrected and evaluated.

Individual study (64 hours out of classroom time). Continuous work of the student is encouraged. The student can count the teacher tutoring time.

Exam (6 hours). Besides having a qualifying function, evaluation is also a tool with which the student checks the degree of understanding and assimilation of knowledge and skills acquired.

Syllabus

The program of the course is subdivided into theoretical lectures and problem-solving classes.

The aim of the theoretical classes it is to present and analyze case studies of chemical processes.

The selection of processes has been carried out according to the following criteria: a) they are processes of industrial importance; b) they allow to know the possibilities of use of different raw materials or production of products of industrial interest; c) they allow to analyze and apply the knowledge acquired in the different subjects to the industrial reality.

The theory and processes are divided into six main blocks, which are schematically:

Block 1. Introduction. The course will be presented and the structure of the chemical processes and raw materials and most important resources will be described (Topic 1).

Block 2. Gas-solid catalytic processes (Topics 2, 3 and 4).

Block 3. Non-catalytic gas-solid process (Topics 5, 6, 7 and 8).

Block 4. Oil refinery (Topics 9 and 10).

Block 5. Petrochemical industry (Topic 11).

Block 6. Biorefinery (Topic 12).

The agenda of theory and approximate distribution of the duration of the different subjects (a total of 40 hours) is as

follows:

Topic 1. Introduction (2 h).

Topic 2. Production of sulfuric acid (5 h).

Topic 3. Production of ammonia (4 h).

Topic 4. Production of nitric acid (1 h).

Topic 5. Transformation of coal and other carbonaceous materials (1 h).

Topic 6. Gas-solid non-catalytic reactions and reactors (4 h).

Topic 7. Combustion (5 h).

Topic 8. Process of gasification (2 h).

Topic 9. Refining of petroleum (1 h).

Topic 10. Processes for obtaining and improving quality of gasoline (7 h).

Topic 11. Petrochemical industry. Obtaining and use of olefins (5 h).

Topic 12. The biorefinery (3 h).

As regards the resolution of problems, it is planned the following time distribution:

1. problems of mass and energy balances in steady state (11 h).

2. problems of mass and energy balances in unsteady-state (9 h).

Course planning and calendar

The course syllabus is divided into the corresponding lectures and problem solving classes. They will be held according to the schedule established by the School of Engineering and Architecture (EINA). In addition, each professor will inform of his hours of tutoring. Tutored work will take place throughout the semester.

Bibliography and recommended resources