

Year: 2018/19

29930 - Chemical Process Control

Syllabus Information

Academic Year: 2018/19

Subject: 29930 - Chemical Process Control

Faculty / School: 110 -

Degree: 330 - Complementos de formación Máster/Doctorado

435 - Bachelor's Degree in Chemical Engineering

ECTS: 6.0

Year: 330 - Complementos de formación Máster/Doctorado: XX
435 - Bachelor's Degree in

Chemical Engineering: 4

Semester: Half-yearly

Subject Type: Compulsory, ENG/Complementos de Formación

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 will take place at several levels: lectures, practical problems (cases) and tutored projects, increasing the level of student participation. In the practical problems and tutored projects, the students will work in small groups of two or three people.

Learning tasks

The program proposed to the student in order to achieve the expected results, includes the following activities:

Theoretical lectures (45 h). Dedicated to explain the different topics and solve some model problems.

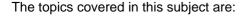
Work in small groups (15 h). In these classes, problems will be solved by students supervised by the professor. Problems or cases will be related to the theoretical part explained in the lectures.

Practical cases in group (20 h Non-contact). Groups of two and three students will be formed throughout the semester. The groups will work on 3 practical cases supervised by the teacher. Tutoring sessions will be scheduled for the resolution of doubts.

Individual study (67 hours). Students perform individual study continuously throughout the semester.

Final Evaluation (3 h). A global test, where the theoretical and practical knowledge gained by the student will be evaluated.

Syllabus



- 1. Introduction. Types of control.
- 2. The control loop.
- 3. Feedback control.
- 4. Industrial Instrumentation.
- 5. Selection of control variables.
- 6. Strategies for the control of key process variables (temperature, pressure, level, flow and composition).
- 7. Dynamic Modeling of processes. Controlled processes.
- 8. Control for safety. Effect of recycles on control: effect "snowball".
- 9. Strategies for controlling reactors.
- 10. Control of heat exchangers, and energy management.
- 11. Control of distillation columns.
- 12. Control of other process units
- 13. Controllability and observability. Multivariable control.

Course planning and calendar

	Theoretical lectures + problems	Practical cases in groups.	Individual study
Introduction. Types of control.	3 h + 0 h		3 h
2. The control loop.	2 h + 0 h		3 h
3. Feedback control.	5 h + 2 h		6 h
4. Industrial Instrumentation.	3 h + 1 h	Case 1 (4 h), T1	5 h
5. Selection of control variables.	2 h + 1 h		6 h
6. Strategies for the control of key process variables (temperature, pressure, level, flow and composition).	4 h + 2 h		5 h
7. Dynamic Modeling of processes. Controlled processes.	5 h + 4 h		7 h
8. Control for safety. Effect of recycles on control: "snowball" effect.	2 h + 1 h		5 h
Strategies for controlling reactors.	4 h + 1 h	Case 2 (6 h), T2	3 h
10. Control of heat exchangers, and energy management.	4 h +1 h		9 h
11. Control of distillation columns.	4 h + 1 h		9 h
12. Control of other process units.	4 h + 1 h	Case 3(10 h), T3	3 h
13. Controllability and observability. Multivariable control.	3h + 0 h		3h
Total	45 h + 15 h	20 h	67 h

Bibliography and recommended resources