# 29936 - Automatic Control Systems

## Syllabus Information

**Academic Year:** 2020/21
**Subject:** 29936 - Automatic Control Systems
**Faculty / School:** 110 - Escuela de Ingeniería y Arquitectura
**Degree:** 435 - Bachelor's Degree in Chemical Engineering
**ECTS:** 6.0
**Year:** 2
**Semester:** Second semester
**Subject Type:** Compulsory
**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 learning process designed for this course is based in the following aspects:**

**1. Master classes** by the teachers.

**2. Resolution of the problems and practical homeworks** proposed during the course.

**3. Lab sessions** for the students supervised by a teacher. The students will apply, in a real or simulated environment, their theoretical knowledge, dealing with the problems and limitations of real systems. All of this will result in a better understanding, deepening and comprehension of the theoretical part of the course.

**4. Autonomous work and study** by the students.

It should be considered that the course has an important theoretical basis and that additionaly the student must understand and assimilate its importance in the world of industrial application.

**The learning process emphasizes**

1. The attendance of the student to the master classes.

2. The personal study.

3. The resolution of problems.

## 4.2.Learning tasks

**The program offered to the student, in order to help him to achieve the expected results, includes the following activities:**

**Masterclasses explaining the theoretical contents.** The contents developed in the course are the following:

1st. BLOCK.- Dynamic Behavior of Continuous-Time Systems.

- Modelling of Continuous-Time Systems.
- Time-Domain Analysis of Continuous-Time Systems.
- Frequency Analysis of Continuous-Time Systems.

2nd. BLOCK.- Feedback Control Systems.

- Feedback Systems.
- Control of Continuous-Time Systems.

3rd. BLOCK. - Logic automatisms.

- Control of Discrete Event Systems.

**Doing exercises** selected from a collection provided for student work.

**Lab sessions**. The sessions will take place in the following laboratories:

- Computer lab for the simulation tasks.
- Lab with Continuous-Time System models. Process control using PLCs (with an integrated PID algorithm) and industrial controllers.
- Lab with a Discrete Event System model. Control using PLCs.

## 4.3.Syllabus

The course will address the following topics:

- Topic 1. Modelling of Continuous-Time Systems
- Topic 2. Time-Domain Analysis of Continuous-Time Systems
- Topic 3. Frequency Analysis of Continuous-Time Systems
- Topic 4. Feedback Systems
- Topic 5. Control of Continuous-Time Systems
- Topic 6. Control of Discrete Event Systems

## 4.4.Course planning and calendar

**Schedule of classes, lab sessions and works presentation**

The schedule of classes and lab sessions of the course is fixed by the Center.
Other learning activities that can be done during the course will be announced with adequate notice.

## 4.5.Bibliography and recommended resources

http://biblos.unizar.es/br/br_citas.php?codigo=29936&year=2019