30020 - Automatic Systems

Información del Plan Docente

Academic Year	2017/18
Faculty / School	110 - Escuela de Ingeniería y Arquitectura
Degree	436 - Bachelor's Degree in Industrial Engineering Technology
ECTS	6.0
Year	3
Semester	First semester
Subject Type	Compulsory
Module	---

1.General information

1.1.Introduction

1.2.Recommendations to take this course

1.3.Context and importance of this course in the degree

1.4.Activities and key dates

2.Learning goals

2.1.Learning goals

2.2.Importance of learning goals

3.Aims of the course and competences

3.1.Aims of the course

3.2.Competences

4.Assessment (1st and 2nd call)

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

5.Methodology, learning tasks, syllabus and resources

5.1.Methodological overview

The methodology is composed of:

1. Theoretical classes where the main subject contents are presented and discussed, student participation is encouraged. The students are directed to the bibliography to foster their self learning
2. Practical exercise sessions.- The students learn how to apply the theoretical concepts. Approximated methods are applied. A set of exercises are proposed to forester the students self learning.

30020 - Automatic Systems

3. Lab sessions.- Focused on simulation and on measurement of the behaviour of real systems. The student learns the connections among the hand-made approximate solutions, the computer simulations and the behavior of the real system.
4. Tutorial sessions.- To guide the students in its self learning.
5. Assessment.- To measure the learning results.

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

Classroom materials will be available via Moodle. These include a repository of the lecture notes used in class, the course syllabus, as well as other course-specific learning materials.

5.2.Learning tasks

The course includes 6 ECTS (150 hours) organized according to:

- Lectures : 45 hours.

- Laboratory sessions: 15 hours.

- Guided assinments: 10 hours

- Autonomous work: 72 hours.

- Tutorials: 4 hours.

- Exams : 4 hours.

Lectures: the professor will explain the theoretical contents of the course and solve illustrative applied problems. These problems and exercises can be found in the problem set provided at the beginning of the semester. Lectures run for 3 weekly hours. Although it is not a mandatory activity, regular attendance is highly recommended.

Laboratory sessions: sessions will take place every 2 weeks (5 sessions in total) and last 3 hours each. Students will work together in groups actively doing tasks such as practical demonstrations, measurements, calculations, and the use of graphical and analytical methods.

Guided assignments: students will complete assignments, problems and exercises related to concepts seen in laboratory sessions and lectures. They will be submitted at the beginning of every laboratory sessions to be discussed and analyzed. If assignments are submitted later, students will not be able to take the assessment test.

30020 - Automatic Systems

Autonomous work: students are expected to spend about 72 hours to study theory, solve problems, prepare lab sessions, and take exams.

Tutorials: the professor's office hours will be posted on Moodle and the degree website to assist students with questions and doubts. It is beneficial for the student to come with clear and specific questions.

5.3.Syllabus

Theoretical sessions

1. Continuous dynamic systems modelling.
2. Dynamic response. Time domain specifications. Stability.
3. Feedback.
4. Root-Locus.
5. Frequency-Response. Bode plot. Nyquist simplified criteria. Frequency domain specifications.
6. Frequency response design.
7. PID control. Empirical methods.
8. Feedforward and minor loop control.

Lab sessions

1. Experiments with a real servomechanism.
2. Root-locus.
3. Analysis and design of P and PI control.
4. PID design.
5. Feedforward and minor loop control.

5.4.Course planning and calendar

For further details concerning the timetable, classroom and further information regarding this course please refer to the EINA School website https://eina.unizar.es/, and to the Moddle site of the course.

5.5.Bibliography and recommended resources