

29817 - Automatic Control Systems

Syllabus Information

Academic year: 2023/24

Subject: 29817 - Automatic Control Systems

Faculty / School: 110 - Escuela de Ingeniería y Arquitectura

326 - Escuela Universitaria Politécnica de Teruel

Degree: 440 - Bachelor's Degree in Electronic and Automatic Engineering

444 - Bachelor's Degree in Electronic and Automatic Engineering

ECTS: 6.0

Year: 2

Semester: Second semester

Subject type: Compulsory

Module:

1. General information

Automatic Systems is a subject of the Industrial Technologies branch. In this context, the basic concepts of system control are presented.

The student learns in the Systems course to analyze and design classical control loops and other control structures.

You are also introduced to computer control. At the end of the subject the student will be able to understand the transcendence of system control and its importance in industrial processes from the technical, economic and environmental point of view.

These approaches and goals are aligned with the Sustainable Development Goals (SDGs) of the 2030 Agenda of United Nations (<https://www.un.org/sustainabledevelopment/es/>), specifically, the learning activities planned in this subject will contribute to the achievement of objective 8.2 of Goal 8, and targets 9.1 and 9.4 of Goal 9.

2. Learning results

- Knows the properties of feedback and basic control actions.
- Know how to apply control design techniques for single-variable continuous systems in the time domain.
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- Know how to select basic control schemes.
- Know how to design logic automatisms based on finite state automata and Petri nets.
- Know how to apply the basic programming techniques of programmable logic controllers.

3. Syllabus

- Presentation of the subject. Historical introduction.
- Control of discrete event systems.
- Feedback Systems Properties of feedback systems. Response in permanent regime. Accuracy.
- Control of Continuous Systems Basic control actions. Controller design. Cancellation of poles and zeros.
 - Place of the roots. Frequency domain controller design.
- Control structures Modifications PID control. Prefeeding. Servo drive. Cascade control.
- Industrial Control Industrial PID controllers.

4. Academic activities

- Lectures (30 hours). Expository sessions of theoretical and practical content.
- Problem classes and case resolution (15 hours). Problems and cases will be developed with the participation of the students.
- Laboratory practices (15 hours). The student will perform the simulation, commissioning, and analysis of real automation and control.
- Teaching assignments (24 hours). Activities that the student will perform alone or in groups and that the teacher will propose throughout the teaching period.
- Study (60 hours). Personal study of the theoretical part of the course and problems.
- Assessment tests (6 hours) The assessment also allows the student to check their degree of understanding and assimilation.

5. Assessment system

- Individual examination (80%). Rated between 0 and 10 points (CT).
- Assessment of practices (20%) (CP): Graded between 0 and 10 points (CP), it may be passed during the term.

In any case, an individual test specific to the practical credits will be given during the assessment period for those students who have not passed during the term or who wish to obtain a higher grade.

In order to pass, it is essential to obtain a CP grade higher or equal to 4 points. Only in that case, the overall grade for the subject will be $(0.20*CP+0.80*CT)$. Otherwise, the overall grade will be the minimum grade between 4 and the result of applying the above formula. The subject is passed with an overall grade of 5 points out of 10..