Course guides
220097 - AUT - Automatic Control

Unit in charge: Terrassa School of Industrial, Aerospace and Audiovisual Engineering
Teaching unit: 707 - ESAII - Department of Automatic Control.
Degree: BACHELOR'S DEGREE IN INDUSTRIAL TECHNOLOGY ENGINEERING (Syllabus 2010). (Compulsory subject).
Academic year: 2020 ECTS Credits: 4.5 Languages: Catalan

LECTURER

Coordinating lecturer: Ramon Comasòlivas
Others: Fatiha Nejjari, Antoni Guasch, Ramon Pérez, Joseba Quevedo

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
2. An understanding of the fundamentals of automation and control methods
1. An understanding of, and skills for, the modelling and simulation of systems

Transversal:
3. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 2. Using strategies for preparing and giving oral presentations. Writing texts and documents whose content is coherent, well structured and free of spelling and grammatical errors.

TEACHING METHODOLOGY

- Sessions display content.
- Sessions for practice.
- Self-study and exercises.
- Preparation and implementation of valuable activities in groups.

The teacher introduce the theoretical fundaments of the subject, concepts, methods and illustrate them with examples appropriate to facilitate understanding.
The students have to study autonomously to assimilate concepts and solve exercises.

LEARNING OBJECTIVES OF THE SUBJECT

- Differentiate between continuous system and discrete system.
- Understand the concept of control in open loop and closed loop.
- Understand the importance of control to improve energy efficiency
- Be able to model physical systems and analyse its time and frequency responses.
- Perform a stability analysis based on the model of the physical system.
- Understand the concept of precision.
- Understand the controllers and being able to design them.
STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours large group</td>
<td>31.0</td>
<td>27.56</td>
</tr>
<tr>
<td>Self study</td>
<td>67.5</td>
<td>60.00</td>
</tr>
<tr>
<td>Hours small group</td>
<td>14.0</td>
<td>12.44</td>
</tr>
</tbody>
</table>

Total learning time: 112.5 h

CONTENTS

**Title Contents 1: Introduction to control systems**

**Full-or-part-time:** 11h  
Theory classes: 2h  
Laboratory classes: 2h  
Self study: 7h

**Title Contents 2: Modeling of dynamic systems**

**Full-or-part-time:** 26h  
Theory classes: 9h  
Laboratory classes: 2h  
Self study: 15h

**Title Contents 3: Time and frequency responses**

**Full-or-part-time:** 31h  
Theory classes: 9h  
Laboratory classes: 4h  
Self study: 18h

**Title Contents 4: Stability and precision**

**Full-or-part-time:** 23h  
Theory classes: 7h  
Laboratory classes: 2h  
Self study: 14h

**Title Contents 5: Design and tuning controllers**

**Full-or-part-time:** 21h 30m  
Theory classes: 4h  
Laboratory classes: 4h  
Self study: 13h 30m
ACTIVITIES

1. THEORY LESSONS

Full-or-part-time: 62h
Theory classes: 25h
Self study: 37h

2. LABORATORY PRACTICE

Full-or-part-time: 34h
Laboratory classes: 14h
Self study: 20h

3. MIDTERM EXAM

Full-or-part-time: 3h
Theory classes: 3h

4. FINAL EXAM

Full-or-part-time: 3h
Theory classes: 3h

5. DIRECTED ACTIVITIES, WRITTEN AND ORAL COMMUNICATION.

Full-or-part-time: 10h 30m
Self study: 10h 30m

GRADING SYSTEM

- 1st Theory exam: 35%
- 2nd Theory exam: 35%
- Evaluation of the practical by examination: 20%
- Continuous assessment practices: 10%

The course will provide for procedures to recover unsatisfactory results. Concretely, the unsatisfactory results obtained from the first exam of theory could be recover by the second theory exam. The obtained qualification of the 2nd theory exam could replace the obtained by the first exam, in the case in which the qualification of the second theory exam be higher than the first one. All students will be entitled to this reconduction.

BIBLIOGRAPHY

Basic:

Complementary:
97806911135762.