220097 - Automatic Control

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 fundamentals 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>Total learning time: 112h 30m</th>
<th>Hours large group:</th>
<th>31h</th>
<th>27.56%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hours medium group:</td>
<td>0h</td>
<td>0.00%</td>
</tr>
<tr>
<td></td>
<td>Hours small group:</td>
<td>14h</td>
<td>12.44%</td>
</tr>
<tr>
<td></td>
<td>Guided activities:</td>
<td>0h</td>
<td>0.00%</td>
</tr>
<tr>
<td></td>
<td>Self study:</td>
<td>67h 30m</td>
<td>60.00%</td>
</tr>
</tbody>
</table>

### Content

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

- Learning time: 11h
  - Theory classes: 2h
  - Laboratory classes: 2h
  - Self study: 7h

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

- Learning time: 26h
  - Theory classes: 9h
  - Laboratory classes: 2h
  - Self study: 15h

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

- Learning time: 31h
  - Theory classes: 9h
  - Laboratory classes: 4h
  - Self study: 18h

#### Title Contents 4: Stability and precision

- Learning time: 23h
  - Theory classes: 7h
  - Laboratory classes: 2h
  - Self study: 14h

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

- Learning time: 21h 30m
  - Theory classes: 4h
  - Laboratory classes: 4h
  - Self study: 13h 30m
## Planning of activities

<table>
<thead>
<tr>
<th>Activity</th>
<th>Hours:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. THEORY LESSONS</strong></td>
<td>62h</td>
</tr>
<tr>
<td>Theory classes</td>
<td>25h</td>
</tr>
<tr>
<td>Self study</td>
<td>37h</td>
</tr>
<tr>
<td><strong>2. LABORATORY PRACTICE</strong></td>
<td>34h</td>
</tr>
<tr>
<td>Self study</td>
<td>20h</td>
</tr>
<tr>
<td>Laboratory classes</td>
<td>14h</td>
</tr>
<tr>
<td><strong>3. MIDTERM EXAM</strong></td>
<td>3h</td>
</tr>
<tr>
<td>Theory classes</td>
<td>3h</td>
</tr>
<tr>
<td><strong>4. FINAL EXAM</strong></td>
<td>3h</td>
</tr>
<tr>
<td>Theory classes</td>
<td>3h</td>
</tr>
<tr>
<td><strong>5. DIRECTED ACTIVITIES, WRITTEN AND ORAL COMMUNICATION.</strong></td>
<td>10h 30m</td>
</tr>
<tr>
<td>Self study</td>
<td>10h 30m</td>
</tr>
</tbody>
</table>

## Qualification 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.
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Bibliography

Basic:


Complementary:


Others resources: