Course guides
820228 - REGA - Automatic Regulation

Unit in charge: Barcelona East School of Engineering
Teaching unit: 707 - ESAII - Department of Automatic Control.

Degree: BACHELOR’S DEGREE IN INDUSTRIAL ELECTRONICS AND AUTOMATIC CONTROL ENGINEERING (Syllabus 2009). (Compulsory subject).

Academic year: 2021  ECTS Credits: 6.0  Languages: Catalan, Spanish

LECTURER

Coordinating lecturer: BEATRIZ FABIOLA GIRALDO GIRALDO

Others:
Primer quadrimestre:
BEATRIZ FABIOLA GIRALDO GIRALDO - M11, M12, M13, M14, M15, M16
JOSÉ MARÍA HUERTA SÁNCHEZ - M11, M12, M13, M14, M15, M16
ABEL TORRES CEBRIAN - M13, M14, M15, M16

Segon quadrimestre:
JOSÉ MARÍA HUERTA SÁNCHEZ - T11, T12, T13, T14

PRIOR SKILLS

Electrical systems, mechanical systems, Mathematics

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
CEEIA-25. Model and simulate systems.

Transversal:
2. TEAMWORK - Level 3. Managing and making work groups effective. Resolving possible conflicts, valuing working with others, assessing the effectiveness of a team and presenting the final results.
3. EFFECTIVE USE OF INFORMATION RESOURCES - Level 3. Planning and using the information necessary for an academic assignment (a final thesis, for example) based on a critical appraisal of the information resources used.

TEACHING METHODOLOGY

The course uses expositive methodology by 20%, an individual class work (problems) by 10%, teamwork (laboratory) by 10%, and individual and group work non-attendance by 60%.

LEARNING OBJECTIVES OF THE SUBJECT

At the end of the course the student will be able to:
1. To acquire basic skills in modeling dynamic systems.
2. To define and know how to apply the general methods of systems analysis.
3. To define and know how to apply the general methods of designing control systems in continuous time.
4. To know how to configure and tune different types of controllers used in the industry.
5. Teamwork.
6. Manage information resources in the field of control systems.
### STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours small group</td>
<td>15,0</td>
<td>10.00</td>
</tr>
<tr>
<td>Self study</td>
<td>90,0</td>
<td>60.00</td>
</tr>
<tr>
<td>Hours large group</td>
<td>45,0</td>
<td>30.00</td>
</tr>
</tbody>
</table>

**Total learning time:** 150 h

### CONTENTS

1. **Introduction to feedback control systems**

   **Description:**

   **Full-or-part-time:** 10h
   - Theory classes: 3h
   - Practical classes: 2h
   - Self study: 5h

2. **Models of dynamic systems**

   **Description:**

   **Full-or-part-time:** 30h
   - Theory classes: 7h 30m
   - Laboratory classes: 2h
   - Self study: 20h 30m

3. **Analysis of time domain systems**

   **Description:**

   **Full-or-part-time:** 30h
   - Theory classes: 9h
   - Laboratory classes: 3h
   - Self study: 18h
4. Stability of linear systems

**Description:**

**Full-or-part-time:** 20h
Theory classes: 6h
Laboratory classes: 2h
Self study : 12h

5. Root locus method

**Description:**
Concept of the root locus. Application of the root locus method to the analysis and design of control systems.

**Full-or-part-time:** 10h
Theory classes: 3h
Laboratory classes: 2h
Self study : 5h

6. Controllers

**Description:**

**Full-or-part-time:** 40h
Theory classes: 10h 30m
Laboratory classes: 3h
Self study : 26h 30m

**GRADING SYSTEM**

Partial controls (2): 30%
Last control: 40%
Practices: 15%
Others test/projects: 10%
Generic competition "Teamwork": 5%

In this subject will schedule a reassessment. The students will be able to access the re-assessment test that meets the requirements set by the EEBE in its Assessment and Permanence Regulations (https://eebe.upc.edu/ca/estudis/normatives-academiques/documents/eebe-normativa-avaluacio-i-permanencia-18-19-aprovat-je-2018-06-13.pdf)

**EXAMINATION RULES.**

The written tests take place within the class schedule.
Practical tests carried out in the laboratory.
BIBLIOGRAPHY

Basic:

Complementary: