Course guides
340130 - ENCO-K6007 - Control Engineering

Unit in charge: Vilanova i la Geltrú School of Engineering
Teaching unit: 707 - ESAII - Department of Automatic Control.

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

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

LECTURER

Coordinating lecturer: Pau Martí i Colom
Others: Martí Colom, Pau

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
1. CE25. Knowledge and ability of systems modeling and simulation.
3. CE29. Ability to design automotion control systems.

TEACHING METHODOLOGY

LEARNING OBJECTIVES OF THE SUBJECT

The subject “Engineering of Control” tries:
- Standardization of knowledge of the students in Control Engineering on the analysis of linear control systems in continuous time as well as discrete time.
- To enable grade students with the capacity of analysing control systems in state-space.
- To enable grade students with the capacity of designing control systems in state-space.

STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours small group</td>
<td>45,0</td>
<td>30.00</td>
</tr>
<tr>
<td>Hours large 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>
</tbody>
</table>

Total learning time: 150 h
## Analysis of control systems in state-space. Continuous systems

**Description:**
In construction

**Full-or-part-time:** 6h
- Theory classes: 1h
- Self study: 5h

## Analysis of control systems in state space. Discrete systems

**Description:**
The specific objective of the subject is to redefine the technique of the space of state for sampled systems.

**Contents**
1. Solution of the homogenous equation
2. Calculation of the transition matrix.
3. Solution of the complete equation.

**Activities, knowledge, abilities, aptitudes**
The pupils will have to be able of:
- To formulate the control systems in discreet time by the route of state variables.
- To solve equations of state for systems in discreet time.

**Commentaries**
The development of the subject can be followed through [Dom02].
A theoretical complement, as well as of exercises and examples, [Oga99]

**Full-or-part-time:** 15h
- Theory classes: 2h
- Laboratory classes: 3h
- Self study: 10h

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## title english

**Description:**
content english

**Full-or-part-time:** 36h
- Theory classes: 4h
- Laboratory classes: 12h
- Self study: 20h

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## title english

**Description:**
content english

**Full-or-part-time:** 31h
- Theory classes: 2h
- Laboratory classes: 9h
- Self study: 20h
title english

Description:
content english

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

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title english

Description:
content english

Full-or-part-time: 36h
Theory classes: 4h
Laboratory classes: 12h
Self study : 20h

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**GRADING SYSTEM**

The qualification of the subject considers all the work carried out throughout the course, assessing both the theoretical and practical aspects

\[
\text{MARK\_CONTINUOUS\_EVALUATION} = 0.3 \times \text{FIRST\_EXAM} + 0.5 \times \text{SECOND\_EXAM} + 0.2 \times \text{LABORATORY}
\]

If the mark of the continuous evaluation is not greater or equal than five, and in accordance to the School regulation, a REEVALUATION exam can be taken whose mark is 100% of the subject

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**BIBLIOGRAPHY**

Basic: