820345 - SECAD - Electronic Systems for Control and Data Acquisition

Coordinating unit: 295 - EEBE - Barcelona East School of Engineering
Teaching unit: 710 - EEL - Department of Electronic Engineering
Academic year: 2015
Degree: BACHELOR'S DEGREE IN ENERGY ENGINEERING (Syllabus 2009). (Teaching unit Optional)
ECTS credits: 6

Teaching staff

Coordinator: HERMINIO MARTÍNEZ GARCÍA.

Others: HERMINIO MARTÍNEZ GARCÍA and other Professors. Their names will be announced to the whole students the first day of the course. Nescolarde Selva, Lexa Digna

Opening hours

Timetable: To determine at the semester beginning. It will be announced to the whole students the first week of the course.

Prior skills

Basically, those associated with the following courses:

- Electronic Systems / Sistemes Electrònics (820017).
- Electrical Systems / Sistemes Elèctrics (820016).

Requirements

- Electronic Systems / Sistemes Electrònics (820017).
- Electrical Systems / Sistemes Elèctrics (820016).

Degree competences to which the subject contributes

Specific:
1. Design an energy saving system using different processes and technologies.
2. Select the components of a control system.

Transversal:
3. SELF-DIRECTED LEARNING - Level 3. Applying the knowledge gained in completing a task according to its relevance and importance. Deciding how to carry out a task, the amount of time to be devoted to it and the most suitable information sources.
4. THIRD LANGUAGE. Learning a third language, preferably English, to a degree of oral and written fluency that fits in with the future needs of the graduates of each course.
820345 - SECAD - Electronic Systems for Control and Data Acquisition

Teaching methodology

There are two 1.5-hour class sessions every week for theory and problems, and a 2-hour class session for laboratory.

Learning objectives of the subject

Please, see Spanish or Catalan version.

Study load

<table>
<thead>
<tr>
<th>Total learning time: 150h</th>
<th>Hours large group: 45h</th>
<th>30.00%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hours small group: 15h</td>
<td>10.00%</td>
</tr>
<tr>
<td></td>
<td>Self study: 90h</td>
<td>60.00%</td>
</tr>
</tbody>
</table>
# 820345 - SECAD - Electronic Systems for Control and Data Acquisition

## Content

<table>
<thead>
<tr>
<th>Section</th>
<th>Learning time</th>
<th>Theory classes</th>
<th>Laboratory classes</th>
<th>Self study</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.- Introduction to Electronic Systems for Mechatronics, Control, and Data Acquisition.</td>
<td>13h</td>
<td>3h</td>
<td></td>
<td>10h</td>
</tr>
<tr>
<td>2.- Sensors and Transducers Used in Electronic Systems for Mechatronics, Control, and Data Acquisition.</td>
<td>17h</td>
<td>6h</td>
<td>1h</td>
<td>10h</td>
</tr>
<tr>
<td>3.- Signal Conditioning in Mechatronics, Control, and Data Acquisition.</td>
<td>17h</td>
<td>6h</td>
<td>1h</td>
<td>10h</td>
</tr>
<tr>
<td>4.- Data Reporting Systems.</td>
<td>16h</td>
<td>6h</td>
<td></td>
<td>10h</td>
</tr>
<tr>
<td>5.- Actuation Systems in Mechatronics, Control, and Data Acquisition: Pneumatics, Hydraulics, Mechanical and Electrical.</td>
<td>16h</td>
<td>6h</td>
<td></td>
<td>10h</td>
</tr>
<tr>
<td>6.- Modeling and Simulation of Electronic Systems for Mechatronics, Control, and Data Acquisition.</td>
<td>18h</td>
<td>6h</td>
<td>2h</td>
<td>10h</td>
</tr>
</tbody>
</table>
The evaluation of the course will be weighted as follows:

- 1 or 2 partial controls: 20%.
- Oral presentation and final exam: 20%.
- Supervised Activities: Implementation of an electronic prototype related to the world of electronic systems addressed to the control and data acquisition (electronic control system of a DC motor or similar): 20%.
- Assessment of the generic abilities assigned to the course, thanks to the implementation of the aforementioned electronic prototype: 20%.
- Activities, and laboratory tests: 20%.

Qualification system

Regulations for carrying out activities

The performance of the different tests consist of:

- Partial Control: Written test, theoretical and/or analysis problems and/or synthesis of an electronic system for control and data acquisition.
- Oral presentation or final test (decide by the student): Oral o written task of a topic related to the course, or theoretical problem based on an electronic system applied to the world of electronic systems addressed to the control and data acquisition.
- Supervised activity: To evaluate transversal (generic) abilities assigned to the course. It will consist of the implementation, individually or in groups of two, of an electronic prototype related to the subject (electronics system for the control of a small DC motor or similar).
- Activities, and laboratory tests: Laboratory activities within the field of electronics focused on the world of electronic systems for control and data acquisition.
Bibliography

Basic:


Complementary:
