820229 - SICIEIA - Information Systems and Industrial Communication

Coordinating unit: 295 - EEBE - Barcelona East School of Engineering
Teaching unit: 707 - ESAII - Department of Automatic Control
Academic year: 2018
Degree: BACHELOR'S DEGREE IN INDUSTRIAL ELECTRONICS AND AUTOMATIC CONTROL ENGINEERING (Syllabus 2009). (Teaching unit Compulsory)
BACHELOR'S DEGREE IN INDUSTRIAL ELECTRONICS AND AUTOMATIC CONTROL ENGINEERING (Syllabus 2009). (Teaching unit Compulsory)
ECTS credits: 6
Teaching languages: Catalan

Teaching staff
Coordinator: Pere Ponsa
Others: Javier Gámiz, Manuel Lozano, Marc Lluva, Pere Ponsa,

Opening hours
Timetable: Room Office A5.42

Requirements
This subject must be developed after Industrial Control and Automation (CIA)

Degree competences to which the subject contributes
Specific:
2. Apply their knowledge to industrial informatics and communications.
3. Design automatic control systems.

Transversal:
06 URI N2. EFFECTIVE USE OF INFORMATION RESOURCES - Level 2. Designing and executing a good strategy for advanced searches using specialized information resources, once the various parts of an academic document have been identified and bibliographical references provided. Choosing suitable information based on its relevance and quality.
1. 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 the teaching class, case study, examples, exercises and project based learning approach.

Learning objectives of the subject
1. Enter the student / the concepts of the various industrial communication techniques, terminology and the reference standards
2. To enable the student / a to discern the functional characteristics of wireless communications and communication networks to plan based industrial field buses.
4. Enter the student / the basic concepts of systems Supervisory Control and Data Acquisition and enable the student / a to define and configure the functionality of the (input-output historical databases, synoptic charts, etc.).
### Study load

<table>
<thead>
<tr>
<th>Total learning time: 150h</th>
<th>Hours large group:</th>
<th>45h</th>
<th>30.00%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours medium group:</td>
<td>0h</td>
<td></td>
<td>0.00%</td>
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<tr>
<td>Hours small group:</td>
<td>15h</td>
<td></td>
<td>10.00%</td>
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<tr>
<td>Guided activities:</td>
<td>0h</td>
<td></td>
<td>0.00%</td>
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<tr>
<td>Self study:</td>
<td>90h</td>
<td></td>
<td>60.00%</td>
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<tr>
<td><strong>Content</strong></td>
<td><strong>Learning time:</strong> 12h</td>
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</tbody>
</table>
| **(ENG) Tema 1: Information systems** | Theory classes: 6h  
Self study: 6h |

**Description:**
1.1. Information systems.
1.2. Manufacturing Operation Management (MOM).
1.3. Information systems in Industry 4.0.
1.4. Human-machine information. GEMMA guideline. Start and stop modes.

**Related activities:**
- Autonomous study
- Exercises
- Report

**Specific objectives:**
Students will be able to:
- identify trends in modern automation systems

<table>
<thead>
<tr>
<th><strong>(ENG) Tema 2: SCADA systems</strong></th>
<th><strong>Learning time:</strong> 12h</th>
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</thead>
</table>
|                            | Theory classes: 6h  
Self study: 6h |

**Description:**
2.1 Definition of supervisory control. From plant to control room.
2.2 Main features of supervision systems.
2.3 SCADA modules.
2.4 Functionality.
2.5 Exercises and examples.
2.6. Design of SCADA applications.

**Related activities:**
- Written exam
- Exercises
- Report
- Practice Laboratory

**Specific objectives:**
Students will be able to:
- Apply a SCADA solution in automation systems.
### (ENG) Tema 3: Communications Systems

<table>
<thead>
<tr>
<th>Description:</th>
<th>Learning time: 12h</th>
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</thead>
<tbody>
<tr>
<td>3.1. Introduction to Communication Systems.</td>
<td>Theory classes: 6h</td>
</tr>
<tr>
<td>3.2. Digital Communications.</td>
<td>Self study: 6h</td>
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<tr>
<td>3.3. Networks topology.</td>
<td></td>
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<tr>
<td>3.4. Reference models. OSI, TCP/IP.</td>
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<tr>
<td>3.5. The connected enterprise.</td>
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</tbody>
</table>

**Related activities:**
- Autonomous study
- Exercises
- Practice Laboratory

**Specific objectives:**
Student will be able to:
Classify Network communications

### (ENG) Tema 4: Industrial networks

<table>
<thead>
<tr>
<th>Description:</th>
<th>Learning time: 12h</th>
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<tbody>
<tr>
<td>4.1 Process control networks.</td>
<td>Theory classes: 6h</td>
</tr>
<tr>
<td>4.2 Field bus. Device Net. Modbus.</td>
<td>Self study: 6h</td>
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<tr>
<td>4.3. Serial communications.</td>
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<tr>
<td>4.4. Ethernet/IP.</td>
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<tr>
<td>4.5. Programmable Logic Controllers networks.</td>
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<tr>
<td>4.6. PLC programming.</td>
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**Related activities:**
- Examen
- Exercises
- Practice laboratory

**Specific objectives:**
Students will be able to
Configure LAN networks and field buses.
# Planning of activities

## AD: Connected Industry

<table>
<thead>
<tr>
<th>Description:</th>
<th>Hours: 57h</th>
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<tr>
<td>The skill in this subject is search of Information resources. Following examples and technical study cases, the students will be able to search information about the connected enterprise (industry 4.0).</td>
<td>Theory classes: 21h</td>
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<td>Self study: 36h</td>
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<tr>
<th>Support materials:</th>
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<tr>
<td>Papers in technical journals.</td>
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## Descriptions of the assignments due and their relation to the assessment:

- Month assessment and deadline (report) at the end of the semester.

<table>
<thead>
<tr>
<th>Specific objectives:</th>
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<tbody>
<tr>
<td>Understand the new industrial paradigm.</td>
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<tr>
<td>Writing a polite technical report in automation.</td>
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## Qualification system

- First exam: 30%
- Second exam: 25%
- Practice Lab: 25%
- Other controls AD: 20%

## Regulations for carrying out activities

The evaluation method of this course meets the current academic regulations to be qualified: NO REVALUABLE.
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Bibliography

Basic:


Complementary:


Others resources:

Teaching material in Virtual Campus.
Teaching help support (Wonderware, Rockwell Automation, SMC),