Degree competences to which the subject contributes

Specific:
1. Enter the students' knowledge of the various industrial communication techniques, terminology and the reference standards
2. Enable the students to discern the functional characteristics of wireless communications and communication networks to plan based industrial field buses.
3. Enter the students' knowledge of the basic concepts of systems Supervisory Control and Data Acquisition and enable the students to define and configure the functionality of the (input-output historical databases, synoptic charts, etc.).
### Study load

<table>
<thead>
<tr>
<th>Activity</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total learning time: 150h</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hours large group:</td>
<td>45h</td>
<td>30.00%</td>
</tr>
<tr>
<td>Hours medium group:</td>
<td>0h</td>
<td>0.00%</td>
</tr>
<tr>
<td>Hours small group:</td>
<td>15h</td>
<td>10.00%</td>
</tr>
<tr>
<td>Guided activities:</td>
<td>0h</td>
<td>0.00%</td>
</tr>
<tr>
<td>Self study:</td>
<td>90h</td>
<td>60.00%</td>
</tr>
</tbody>
</table>
## Content

### (ENG) Tema 1: Information systems

<table>
<thead>
<tr>
<th>Description:</th>
<th>Learning time: 12h</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1. Information systems.</td>
<td></td>
</tr>
<tr>
<td>1.2. Manufacturing Operation Management (MOM).</td>
<td></td>
</tr>
<tr>
<td>1.3. Information systems in Industry 4.0.</td>
<td></td>
</tr>
<tr>
<td>1.4. Human-machine information. GEMMA guideline. Start and stop modes.</td>
<td></td>
</tr>
</tbody>
</table>

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

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

### (ENG) Tema 2: SCADA systems

<table>
<thead>
<tr>
<th>Description:</th>
<th>Learning time: 12h</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 Definition of supervisory control. From plant to control room.</td>
<td></td>
</tr>
<tr>
<td>2.2 Main features of supervision systems.</td>
<td></td>
</tr>
<tr>
<td>2.3 SCADA modules.</td>
<td></td>
</tr>
<tr>
<td>2.4 Functionality.</td>
<td></td>
</tr>
<tr>
<td>2.5 Exercises and examples.</td>
<td></td>
</tr>
<tr>
<td>2.6. Design of SCADA applications.</td>
<td></td>
</tr>
</tbody>
</table>

**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

**Learning time:** 12h  
Theory classes: 6h  
Self study: 6h

**Description:**
1. Introduction to Communication Systems.  
2. Digital Communications.  
3. Networks topology.  
4. Reference models. OSI, TCP/IP.  
5. The connected enterprise.

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

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

### (ENG) Tema 4: Industrial networks

**Learning time:** 12h  
Theory classes: 6h  
Self study: 6h

**Description:**
3. Serial communications.  
4. Ethernet/IP.  
5. Programmable Logic Controllers networks.  
6. PLC programming.

**Related activities:**  
- Examen  
- Exercises  
- Practice laboratory

**Specific objectives:**  
Students will be able to:  
Configure LAN networks and field buses.
### (ENG) Tema 5: Practices of Laboratory

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
</table>
5.2. Control level. Input/Output connectivity to PLC. Automatic control with PLC.  
5.3. Communications level. Serial Communications. PC network,  
5.4. Communications level. Ethernet network. PLC network.  
5.5. Communications level. SCADA-PLC communications |

### Specific objectives:

Students will be able to:
- acquire skills in advanced automation systems.

### Planning of activities

<table>
<thead>
<tr>
<th>AD: Connected Industry</th>
<th>Hours: 57h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theory classes: 21h</td>
<td></td>
</tr>
<tr>
<td>Self study: 36h</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description:</th>
</tr>
</thead>
<tbody>
<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>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Support materials:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Papers in technical journals.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Descriptions of the assignments due and their relation to the assessment:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Month assessment and deadline (report) at the end of the semester.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Specific objectives:</th>
</tr>
</thead>
</table>
| Understand the new industrial paradigm.  
Writing a polite technical report in automation. |

### 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.
820229 - SICIEIA - Information Systems and Industrial Communication

Bibliography

Basic:


Complementary:


Others resources:

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