Course guides
340242 - SDIN-K7P07 - Distributed Industrial Systems

Unit in charge: Vilanova i la Geltrú School of Engineering
Teaching unit: 707 - ESAII - Department of Automatic Control.
Degree: BACHELOR’S DEGREE IN INDUSTRIAL ELECTRONICS AND AUTOMATIC CONTROL ENGINEERING (Syllabus 2009). (Optional subject).
Academic year: 2021
ECTS Credits: 6.0
Languages: Catalan, Spanish

LECTURER
Coordinating lecturer: Samà Monsonís, Albert
Others:

PRIOR SKILLS
It is recommended that students took Industrial Informatics lectures

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES
Specific:
1. CE28. Applied knowledge of industrial and communication computing.

TEACHING METHODOLOGY
The teaching methodologies include classes, problem solving, lab sessions, autonomous learning and supervised activities

LEARNING OBJECTIVES OF THE SUBJECT
Objectives
1. Characteristics of the industrial distributed systems
2. Analysis of the computation and communication systems in industrial distributed systems
3. Design and implement device-level communications under different environments: CAN, ETHERNET and OPC

STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
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<tbody>
<tr>
<td>Hours large group</td>
<td>30.0</td>
<td>20.00</td>
</tr>
<tr>
<td>Self study</td>
<td>90.0</td>
<td>60.00</td>
</tr>
<tr>
<td>Hours small group</td>
<td>30.0</td>
<td>20.00</td>
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</tbody>
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Total learning time: 150 h
CONTENTS

Introduction to distributed industrial systems

Description:
2. OSI model
3. Point-to-point communications and field bus
4. Buses and industrial networks, middlewares for industrial applications
5. CAN - Controller Area Network
6. Ethernet
7. OPC - OLE for Process Control

Full-or-part-time: 13h
Theory classes: 1h
Guided activities: 3h
Self study : 9h

Controller Area Network

Description:
1. CAN characteristics
2. Physical layer
3. Media access
4. Use of CAN in the industry
5. CAN i Arduino UNO

Related activities:
Lab: sessions working with an Arduino UNO development board

Full-or-part-time: 63h
Theory classes: 7h
Laboratory classes: 17h
Self study : 39h

Ethernet and OPC

Description:
1. Ethernet characteristics
2. Physical layer and media acces. Transport layer.
3. OPC protocol characteristics
4. Use of OPC and Ethernet in the industry
5. Ethernet, OPC and Raspberry

Related activities:
Lab: sessions with Raspberry and OPC servers

Full-or-part-time: 74h
Theory classes: 7h
Laboratory classes: 28h
Self study : 39h

GRADING SYSTEM
BIBLIOGRAPHY

Basic: