



IDENTIFYING DATA

Industrial Communications

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|---------------------|---|----------|------|------------|
| Subject | Industrial Communications | | | |
| Code | V04M093V01104 | | | |
| Study programme | Máster Universitario en Mecatrónica | | | |
| Descriptors | ECTS Credits | Choose | Year | Quadmester |
| | 3 | Optional | 1st | 1st |
| Teaching language | Spanish Galician | | | |
| Department | | | | |
| Coordinator | Díaz-Cacho Medina, Miguel Ramón | | | |
| Lecturers | Díaz-Cacho Medina, Miguel Ramón Garrido Campos, Julio Prado Cambeiro, Jaime | | | |
| E-mail | mcacho@uvigo.es | | | |
| Web | | | | |
| General description | (*)Diseño e implementación de sistemas de comunicación para la mecatrónica | | | |

Training and Learning Results

| | |
|------|--|
| Code | |
| B1 | (*)Capacidad para proyectar, calcular y diseñar productos y sistemas mecatrónicos |
| B2 | (*)Capacidad para integrar las tecnologías de control, electrónica e informática en el diseño de un componente o de un sistemas mecánico |
| B5 | (*)Capacidad de análisis y síntesis y de resolver problemas y tomar decisiones con iniciativa, creatividad y razonamiento crítico |
| B6 | (*)Destreza en la aplicación de herramientas informáticas en el ámbito de la ingeniería |
| B7 | (*)Capacidad para el manejo de especificaciones, reglamentos y normas de obligado cumplimiento |
| B10 | (*)Capacidad para comunicarse con personas no expertas en la materia y transmitir conceptos, especificaciones y funcionalidades en el campo de la ingeniería, tanto oralmente como de manera escrita |
| B12 | |
| C2 | |
| C4 | |

Expected results from this subject

| Expected results from this subject | Training and Learning Results |
|--|-------------------------------|
| Skill in the handle of buses of field and his resources. | B6 B7 B10 B12 C2 |
| Knowledge of the foundations of the systems of industrial communication. | B7 B10 B12 C2 C4 |

| | |
|--|--|
| Knowledges to design and implement systems of communication for the *mecatrónica | B1 B2 B5 B6 B7 C2 C4 |
| Capacity to monitor and keep buses of field in systems *mecatrónicos complexes | B6 B7 C2 |

Contents

| Topic | |
|---|---|
| Subject 1.- Introduction to the industrial communications | Networks of data: networks of company and of factory, networks of cell. Networks of control: networks of controllers, networks of sensors-actuators |
| Subject 2.- Principles and operation of distinct buses of field | General characteristics. Physical layer. Layer of link. Control of access to the half. Logical control. Layer of application. |
| Subject 3.- Structural elements of distinct buses of field | Units of entrance-remote exit. Sensors/Actuators with resources of communication integrated. Main modules. Modules runway. *Repetidores. Modules of link. |
| Subject 4.- Parametrisation and set up of distinct field-buses. Monitoring and Diagnostic | Bus PROFIBUS-DP. Bus PROFINET. Bus ETHERCAT. |
| Subject 5. IIoT. Protocols and Technologies. | ModBus, MQTT, OPC-UA. |

Planning

| | Class hours | Hours outside the classroom | Total hours |
|---------------------------------|-------------|-----------------------------|-------------|
| Lecturing | 4 | 10 | 14 |
| Case studies | 4 | 20 | 24 |
| Laboratory practical | 8 | 15 | 23 |
| Problem and/or exercise solving | 2 | 4 | 6 |
| Laboratory practice | 2 | 6 | 8 |

*The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

Methodologies

| | Description |
|----------------------|--|
| Lecturing | Presentation of contents in the classroom with help of computer and audiovisual means. |
| Case studies | Solution of practical cases with help of computer tools. Work in team. |
| Laboratory practical | In technological laboratories or in computer classrooms. |

Personalized assistance

| Methodologies | Description |
|----------------------|--|
| Case studies | It will orient to the student of individual form on the steps to be followed for the resolution of his doubts. |
| Laboratory practical | It will work with the student in real time, monitoring *continuamente his evolution. |

Assessment

| | Description | Qualification | Training and Learning Results | |
|---------------------------------|---|---------------|-------------------------------|----------|
| Case studies | Individual work of a case of industrial communications based on the theoretical contents. The work is proposed by the teacher. | 30 | B1 B6 | C2 |
| Problem and/or exercise solving | Written exam | 20 | B1 B2 B5 B6 B7 | C2 C4 |
| Laboratory practice | Realisation and understanding of the practices. Eventually, the assistance to seminars, depending on his nature are valuable.. would be valuable. | 50 | B10 B12 | C2 C4 |

Other comments on the Evaluation

The evaluation by written exam will suppose 20% of the global qualification. The qualification corresponding to the correct resolution of each one of the questions that compose it will be specifically stated. The sum of these qualifications will be 10

points.

The evaluation of practical tests, execution of real and / or simulated tasks will be part of the overall qualification, and will account for 50% of it. Attendance at practices will account for 25% of the grade and participation and results of the proposed problems will account for 25%. Their evaluation may be carried out continuously, in the form of questions throughout the teaching of the practices. Attendance to the practices will be verified by means of signature sheets.

The case study will consist of individual student work based on the content of the subject. The grade obtained will have a weight of 30% of the global.

The global rating will be calculated as a weighted average of the ratings obtained in each methodology. It will be necessary to obtain a minimum qualification (which will be recorded in each evaluation test) in each of the parts and a global one equal to or greater than 5 points to pass the subject. The evaluation criteria will be specific in each test.

Sources of information

Basic Bibliography

Complementary Bibliography

J.I. Armesto, J. López, R. Marín, **Presentaciones utilizadas en la asignatura,**

E. Mandado, J. Marcos, C. Fernández, J.I. Armesto, **Autómatas programables y sistemas de automatización, 2ª,**

A. Rodríguez, **Comunicaciones industriales, 1ª,**

Recommendations