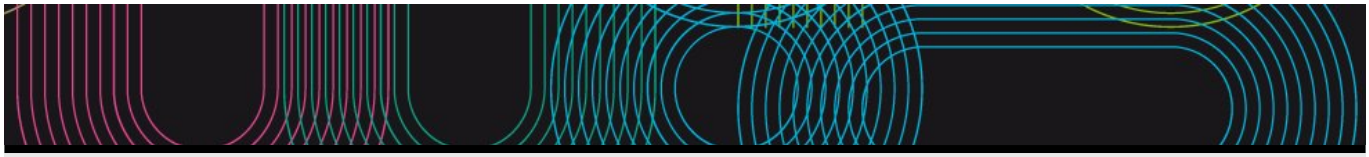

| IDENTIFYING DATA | | | | |
|---|---|---|---|---|
| **Industrial Communications** | | | | |
| Subject | Industrial Communications | | | |
| Code | V04M093V01104 | | | |
| Study programme | (*)Máster Universitario en Mecatrónica | | | |
| Descriptors | ECTS Credits | Choose | Year | Quadmester |
| |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

| Competencies | |
|---|---|
| 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 | |

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

| | |
|---|---|
| Knowledges to design and implement systems of communication for the *mecatrónica | B1<br>B2<br>B5<br>B6<br>B7<br>C2<br>C4 |
| Capacity to monitor and keep buses of field in systems *mecatrónicos complexes | B6<br>B7<br>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 buses of field | Bus *PROFIBUS-*DP. Bus *PROFINET. Bus *ETHERCAT. |
| Subject 5.- Monitoring and diagnostic of operation of distinct buses of field | Bus *PROFIBUS-*DP. Bus *PROFINET. Bus *ETHERCAT. |

| **Planning** | | | |
|---|---|---|---|
| | Class hours | Hours outside the classroom | Total hours |
| Lecturing | 12 | 25 | 37 |
| Case studies | 4 | 8 | 12 |
| Laboratory practical | 4 | 8 | 12 |
| 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 *contínuamente his evolution. |

| **Assessment** | | | | |
|---|---|---|---|---|
| | Description | Qualification | Training and Learning Results | |
| Problem and/or exercise solving | Written exam | 40 | B1<br>B2<br>B5<br>B6<br>B7 | C2<br>C4 |
| Laboratory practice | Realisation and understanding of the practices. Eventually, the assistance to seminars, depending on his nature are valuable.. would be valuable. | 60 | B10<br>B12 | C2<br>C4 |

**Other comments on the Evaluation**

The evaluation by means of a written examination written has a weight of 40% of the final score.

The evaluation of laboratory tasks and or simulated tasks has a weight of 60% of the final score. The assistance to the

laboratory practices will have a weight of 35% of the final score and the resolution of practical problems in laboratory will a have a weight of 25% of the final score.

It is necessary to have a qualification equal or bigger than the 50% of the maximum final score.

## 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

## Contingency plan

### Description

=== EXCEPTIONAL MEASURES SCHEDULED ===

STAGE 1: MIXED TEACHING

Because of the exceptional situation, due the impossibility to teach in person, the teaching will be performed in an online way.

For the online teaching, we will use the tools provided by the University, at present the "Remote Campus" and FAITIC tools. Nevertheless it will be able to be complemented by using other means.

STAGE 2: TEACHING COMPLETELY ONLINE.

Because of the exceptional situation, due the impossibility to teach in person, the teaching will be perform in an online way.

All the teaching will use the tools provided by the University, at present the "Remote Campus" and FAITIC tools. Nevertheless it will be able to be complemented by using other means.

=== ADAPTATION OF THE METHODOLOGIES ===

For the laboratory practices, we will substitute the practices that require specific equipment by virtualized practices or simulated ones. Eventually, other similar practices will be proposed that are able to be performed online or at home. The practices will be able to have an autonomous format to prevent conciliation problems and/or connectivity problems..

Tutoring sessions (attention to the students) will be done using telematic tools (Email, FAITIC forums, Remote Campus), that will be complemented by using other means. In some cases an appointment will be necessary.

=== ADAPTATION OF THE EVALUATION ===

The evaluation in the case of no-presence will be done by using of on-line proofs using Remote Campus and FAITIC.

Practical works will be evaluated with a report provided by the students.