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|---|---|
| **Centre** | **University College of Engineering of Vitoria-Gasteiz** |
| **Name of subject** | **26041 – Automata Programming** |
| **Qualification** | **Degree in Computer Management and Information Systems Engineering** |
| **Type** | **Elective** |
| **Credits** | **6 ECTS** |
| **Year** | **4** |
| **Term(s)** | **1st** |
| **Department** | **Systems and Automatics Engineering** |
| **Language** | **Spanish** |

## Outcomes / Objectives

Introduction to the automation of processes that use digital and analogue variables in today's industry.

## Syllabus

Introduction to Industrial Process Control. Local control loops. Introduction to Automation for application in the digital control of industrial processes. The course introduces the need to control industrial production plants to achieve optimal operation of industrial facilities. The most important concepts are: the automation pyramid, automata, and control loops. Automata architecture. The course describes the basic elements of automata. logical systems and Boolean algebra. Need of Boolean algebra knowledge for automata programming. Combinatorial automation systems. Need for and design of combinatorial automata. The most important concepts are basic logic functions, logic equations and truth tables. Sequential automation systems. Need for and design of sequential automata. The most important concepts are state machines. Automata programming elements. Industrial automata programming. Binary sensors. Have knowledge of binary sensors and actuators and use the most common ones. Electric actuators. Introduction to the knowledge and modes of application of actuators and sensors (transducers).

# Methodology

### Teaching Method

| **Face-to-Face Teaching Hours** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Lectures** | **Seminars** | **Classroom practice** | **Lab. practice** | **Computer sessions** | **Clinical practice** | **Workshops** | **Industrial workshops** | **Field practice** |
| **20** | | | **40** | | | | | |
| **Student Hours of Non Face-To-Face Activities** | | | | | | | | |
| **Lectures** | **Seminars** | **Classroom practice** | **Lab. practice** | **Computer sessions** | **Clinical practice** | **Workshops** | **Industrial workshops** | **Field practice** |
| **30** | | | **60** | | | | | |

# Bibliography

## Basic Bibliography


- Balcells J. y Romeral J.L.: Autómatas Programables. Editorial Marcombo,1997.
- Mandado Pérez E. y Otros: Controladores Lógicos y Autómatas Programables. Editorial Marcombo 1992.
- García Moreno E.: Automatización de procesos industriales. Editorial UPV1999.
- Michel Giles: Autómatas Programables Industriales: arquitectura y aplicaciones. Editorial Marcombo 1995.
- Porras A. y Montanero A.P.: Autómatas Programables.. McGraw Hill,1992.
- Berger Helmuth: Automatización con S5-115U. Editorial Siemens A.G.1987.7 Norma EN 61131.3


## In-depth Bibliography


- Romera J.P. Lorite J.A. y Montoro S.: Automatización problemas resueltos con autómatas programables. Editorial Paraninfo 1995.
- Ojeda F.: Problemas de diseño de automatismos. EditorialParaninfo 1996.
- Tutoriales de Programación, diagrama de relés, lista de instrucciones y funciones lógicas.
- Guerricagoitia Pedro Mª. Ejercicios de Automatización Industrial. Apuntes Interno. 2002.
- Software Step 7, CX-Programmer, PLCsim.6 Software WinCC, CX-Supervisor7 Software S7-Graph


## Websites


- www.ehu.es/
- http://moodle.ehu.es/moodle/ (Students can access moodle on this address, where they will find notes, presentations, summaries, outlines of practicals and relevant dates for the subject)
- http://w1.siemens.com/entry/es/es/çwww.amazon.com (very useful for buying in-depth study books)
- http://www.diazdesantos.es/ (for buying basic bibliography)
- www.elhuyar.com (for purchasing books in Basque)
- http://industrial.omron.es/