**IDENTIFYING DATA**

**Computer science: Computing for engineering**

| Subject | Computer science: Computing for engineering | | | |
|---|---|---|---|---|
| Code | V12G330V01203 | | | |
| Study programme | Degree in Industrial Electronics and Automation Engineering | | | |
| Descriptors | ECTS Credits | Choose | Year | Quadmester |
| | 6 | Basic education | 1st | 2nd |
| Teaching language | Spanish Galician English | | | |
| Department | Systems Engineering and Automatisms Computer Sciences | | | |
| Coordinator | Rodríguez Damian, María Sáez López, Juan | | | |
| Lecturers | Castelo Boo, Santiago Ibáñez Paz, Regina Pérez Cota, Manuel Rodríguez Damian, Amparo Rodríguez Damian, María Rodríguez Diéguez, Amador Sáez López, Juan Sanz Dominguez, Rafael Vázquez Núñez, Fernando Antonio Vázquez Núñez, Francisco José | | | |
| E-mail | mrdamian@uvigo.es juansaez@uvigo.es | | | |
| Web | http://faitic.uvigo.es | | | |
| General description | They treat the following contents: Methods and basic algorithms of programming Programming of computers by means of a language of high level Architecture of computers Operating systems basic Concepts of databases | | | |

**Competencies**

| Code | |
|---|---|
| B3 | CG3 Knowledge in basic and technological subjects that will enable students to learn new methods and theories, and provide them the versatility to adapt to new situations. |
| B4 | CG4 Ability to solve problems with initiative, decision making, creativity, critical thinking and the ability to communicate and transmit knowledge and skills in the scope of industrial engineering in the field of Industrial Electronic and Automation. |
| C3 | CE3 Basic knowledge on the use and programming of computers, operating systems, databases and software applications in engineering. |
| D1 | CT1 Analysis and synthesis. |
| D2 | CT2 Problems resolution. |
| D5 | CT5 Information Management. |
| D6 | CT6 Application of computer science in the field of study. |
| D7 | CT7 Ability to organize and plan. |
| D17 | CT17 Working as a team. |

## Learning outcomes

| Expected results from this subject | Training and Learning Results | | |
|---|---|---|---|
| Computer and operating system skills. | B3 | C3 | D5 D6 D7 |
| Basic understanding of how computers work | B3 | C3 | D1 D5 |
| Skills regarding the use of computer tools for engineering | B3 | C3 | D5 D6 D7 D17 |
| Database fundamentals | B3 | C3 | D1 D5 D6 D7 |
| Capability to implement simple algorythims using a programming language | B3 B4 | C3 | D2 D7 D17 |
| Structured and modular programming fundamentals | B3 B4 | C3 | D2 D5 D17 |

## Contents

| Topic | |
|---|---|
| Basic computer architecture | Basic components Peripheral devices Communications |
| Basic programming concepts and techniques applied to engineering | Data structures Control structures Structured programming Information treatment Graphical user interfaces |
| Operating systems | Basic principles Types |
| Practical exercises that support and secure the theoretical concepts | Practical exercises that will allow the students to verify the concepts learned in class and see that using them they can solve problems |
| Computer tools applied to engineering | Types and examples |

## Planning

| | Class hours | Hours outside the classroom | Total hours |
|---|---|---|---|
| Introductory activities | 1 | 1 | 2 |
| Laboratory practices | 22 | 30 | 52 |
| Case studies | 12 | 14 | 26 |
| Lecturing | 8 | 12 | 20 |
| Objective questions exam | 4 | 7 | 11 |
| Laboratory practice | 6 | 8 | 14 |
| Essay questions exam | 10 | 15 | 25 |

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

## Methodologies

| | Description |
|---|---|
| Introductory activities | Activities related to estashing contact, gathering information from the students, organizing groups, as well as presenting the course. |
| Laboratory practices | Activities related to applying the knowledge obtained to specific situations and acquiring basic and procedimental skills related with the subject being studied. Developed in specialized spaces with specialized equipment (labs, computer rooms, etc). |
| Case studies | Analyze a fact, problem or real event with the purpose of knowing it, interpreting it, resolving it, generating hypothesis, contrasting data, thinking about it, gaining new knowledge, diagnosing it and training alternative solutions |
| Lecturing | Exhibition of the contents that make up the subject being studied on behalf of the profesor, theoretical principles and/or instructions regarding an assignment, exercise or project to be developed by the student. |

## Personalized attention

| Methodologies | Description |
|---|---|
| Laboratory practices | |

## Assessment

| | Description | Qualification | Training and Learning Results | | |
|---|---|---|---|---|---|
| Objective questions exam | Tests for evaluating aquired competencies that include cuestions from which the student must choose a response from a set of alternatives (true/false, multiple choice,...) | 15 | B3 | C3 | D5 |
| Laboratory practice | Tests for evaluating aquired competencies that include activities, problems or practical excercises to be solved. | 60 | B3 B4 | C3 | D1 D2 D5 D6 D7 D17 |
| Essay questions exam | Tests for evaluating aquired competencies that include cuestions regarding a subject. The students must develop, relate, organize and present their knowledge regarding the subject. | 25 | B3 B4 | C3 | D1 D2 D5 D6 D7 |

## Other comments on the Evaluation

Ethical commitment:

Students are expected to behave ethically. If unethical behaviour is detected (copying,plagiarism, use of unauthorized electronic

devices and others), then it will beconsidered that the student does not meet the minimum requirements to pass thecourse. In this case, the final grade for the current academic year will befailed (0.0).

In additionto the ethical commitment, the following is underlined:
In the first place, a person registered in the course is by default subject to the continuous assessment system; if the student does not want to be in this system, the he/she must expressly renounce to it within the established deadlines.

**CONTINUOUSASSESSMENT OPERATION**

In the present course, the continuous assessment will collect all the evidence oflearning from the person enrolled and will be grouped into three assessments.The first two will take place preferably in the laboratories: Test 1 and Test2. The third evaluation may be written: Test 3. If the student does notrenounce to the continuous evaluation system, tests that are not attended will be considered as qualified as zero (0.0). A minimum score of 30% out of 10 (3.0points) must be obtained in the last two evaluations: Test 2 and Test 3, inorder to be eligible to have the final average calculated. If this requirementis not met and the final average is equal to or greater than 5, the final gradewill be 4:


Test 1 * 0.2 + (Test 2>=3) * 0. 4 + (Test 3>=3) * 0. 4 >=5

A studentis considered passed if he/she obtains a five or more in compliance with allthe requirements.

First call (May/June):

The following must be met to pass the subject under continuous assessment:
Test 1 * 0.2 + (Test 2>=3) * 0. 4 + (Test 3>=3) * 0. 4 >= 5

Once thefirst evaluation: Test 1, has been carried out, the person enrolled may requestto abandon the continuous evaluation system (within the period and by the meansestablished by the teaching staff). In this way, the person enrolled will beable to follow the non-continuous assessment system.

Second call (June/July):

If a person does not reach the passing level in the first exam (May/June) but has passed the minimum mark in the second exam: Test 2, in the second call (June/July) he/she can choose to keep the grades of the first two tests, and take a 4-points exam, or take a 100% exam in the subject (10 points). If the person takes the 4-points test, he/she will be asked for a minimum score of 30% out of 10 (3. 0 points) in order to calculate the final grade. If this requirement is not met and the final average is equal to or greater than 5, the final grade will be 4.

**NON-CONTINUOUS EVALUATION OPERATION**

An exam that allows students to obtain 100% of the grade.  The exam may be divided into sections, minimuns can be required.

First call (May/June):

Registered students who have expressly renounced to the continuous assessment system may take the May/June exam (on the date and at the time proposed by the School) and take an exam that allows them to obtain 100% of the grade. This exam is not open to those who have failed the continuous assessment.

Second call (June/July):

An exam will be proposed to evaluate 100% of the subject, for those who have not achieved the minimum mark in the first call.
The version of the guide was made in Spanish. For any doubt or contradiction, the Spanish guide will be mandatory.

| Sources of information |
| --- |
| **Basic Bibliography** |
| Newsome, Bryan , 2015, **Visual Basic**, John Wiley &amp; Sons, 2015 |
| Ceballos Sierra, F. Javier, **Microsoft Visual Basic.Net**, Rama, 2007 |
| Alberto Prieto Espinosa, **Introducción a la informática**, McGraww Hill, 2006 |
| **Complementary Bibliography** |
| Tanenbaum, Andrew S., **Sistemas Operativos Modernos**, Pearson Educacion, 2009 |
| Balena, Francesco, **Programación avanzada con Microsoft Visual Basic .NET**, McGraw-Hill, 2003 |
| Silberschatz, Abraham ,Korth Henry, Sudarshan, S., **Fundamentos de bases de datos**, McGraw-Hill, 2014 |

**Recommendations**