



## IDENTIFYING DATA

### Computing: Computing for Engineering

Subject	Computing: Computing for Engineering			
Code	V09G291V01110			
Study programme	Grado en Ingeniería de la Energía			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Basic education	1st	2nd
Teaching language	#EnglishFriendly Spanish Galician			
Department				
Coordinator	Pérez Cota, Manuel			
Lecturers	Ibáñez Paz, Regina Pérez Cota, Manuel			
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General description	In this subject will be established the basic contents of computing and of introduction to the programming, as well as the basic computer tools for the Engineering. English Friendly subject: International students may request from the teachers: a) materials and bibliographic references in English, b) tutoring sessions in English, c) exams and assessments in English.			

## Training and Learning Results

Code	
A1	That the students demonstrate to possess and understand knowledge in an area of study that is part of the general education (second level), and often found at a level that, although based on advanced textbooks, also includes some aspects that involve knowledge from the avant-garde of the field of study
A2	That the students know how to apply their knowledge to their work or vocation in a professional way and that they possess the competences that are usually demonstrated through the elaboration and defense of arguments and the resolution of problems within their area of study
A3	That the students have the capability to gather and interpret relevant data (usually within their area of study) to issue judgments that include a reflection on relevant social, scientific or ethical issues
A4	That the students can transmit information, ideas, problems and solutions to a specialized and non-specialized audience
A5	That the students develop those learning capabilities necessary to undertake further studies with a high degree of autonomy.
B3	To suggest and develop practical solutions, using the relevant theoretical knowledge, to phenomena and problems-situations of ordinary reality that are specific to engineering, developing appropriate strategies.
B5	To be familiar with the relevant sources of information, including constant updating, in order to practice one's profession competently, accessing all the present and future tools of information search, constantly adapting to technological and social changes.
C3	Basic knowledge of use and programming of computers, operating systems, data bases and computer programs that can be applied in engineering.
D2	Ability to organize, understand, assimilate, produce and handle all the relevant information to develop their professional work, using appropriate computing, mathematics, physics tools, etc. when these are required.

## Expected results from this subject

Expected results from this subject	Training and Learning Results			
Skills in handling of computers and operating systems	A1	B3	C3	D2
	A2	B5		
	A3			
	A4			
	A5			

Understanding of basic operation of the computers	A1 A2 A3 A4 A5	B3 B5	C3	D2
Skills in handling of computer tools for engineering	A1 A2 A3 A4 A5	B3 B5	C3	D2
Knowledge on the databases foundations	A1 A2 A3 A4 A5	B3 B5	C3	D2
Capacity to implement simple algorithms in some programming language	A1 A2 A3 A4 A5	B3 B5	C3	D2
Knowledge of the structured and modular programming foundations	A1 A2 A3 A4 A5	B3 B5	C3	D2

## Contents

Topic	
Computing Foundations	The computing in the Engineering Evolution of the systems Numbering Systems and coding
Computers Architecture	Basic components Communications Systems Architecture
Tools for the Engineering	Office Packages Spreadsheets Presentation Systems Databases
Programming Methods	Structured and modular Programming Programming Logic Programming languages Structures of a program and development of a program
Programming - basic concepts	Data types and variables Input / Output Flow control
Programming - advanced concepts	Functions Complex data types Files and data persistence systems Object Oriented Programming and other paradigms
The computing in the engineering	Security Systems Electronic signature Usability Libraries Complex Calculus Graphic Representation

## Planning

	Class hours	Hours outside the classroom	Total hours
Lecturing	30	20	50
Practices through ICT	20	42.5	62.5
Case studies	0	35	35
Essay questions exam	0.5	0	0.5
Problem and/or exercise solving	1	0	1
Case studies	1	0	1

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

<b>Methodologies</b>	
	Description
Lecturing	In main lectures (physical or virtual) it will be explained concepts that, already had been indicated to students, so that the participation should be rich and the concepts should be acquired easily.
Practices through ICT	It will be developed practical exercises (physical or virtual) that allow to develop, by means of the computer concepts explained in main lectures. It will be pretended that the students can create their own systems in base to a solid logic.
Case studies	It will be analyzed and solved real professional problems

<b>Personalized assistance</b>	
<b>Methodologies</b>	<b>Description</b>
Practices through ICT	It will be pretended that the students can explain their doubts about developing the problems and in the practical part help them to solve those and clarify them.

<b>Assessment</b>				
	Description	Qualification	Training and Learning Results	
Essay questions exam	They will make a series of questions that allow to know the competences obtained by the students (can be physical or virtual). EXPECTED RESULTS FROM THIS SUBJECT: Skills in handling of computers and operating systems. Understanding of basic operation of the computers. Skills in handling of computer tools for engineering. Knowledge on the databases foundations. Capacity to implement simple algorithms in some programming language. Knowledge of the structured and modular programming foundations.	40	A1 A2 A3 A4 A5	B3 B5 C3 D2
Problem and/or exercise solving	Development of an or several exercises or problems that allow to know the competences obtained by the students (can be physical or virtual). EXPECTED RESULTS FROM THIS SUBJECT: Skills in handling of computers and operating systems. Understanding of basic operation of the computers. Skills in handling of computer tools for engineering. Knowledge on the databases foundations. Capacity to implement simple algorithms in some programming language. Knowledge of the structured and modular programming foundations.	40	A1 A2 A3 A4 A5	B3 B5 C3 D2
Case studies	Development of one or several case exercises or problems that allow to know the competences obtained by the students (can be physical or virtual). EXPECTED RESULTS FROM THIS SUBJECT: Skills in handling of computers and operating systems. Understanding of basic operation of the computers. Skills in handling of computer tools for engineering. Knowledge on the databases foundations. Capacity to implement simple algorithms in some programming language. Knowledge of the structured and modular programming foundations	20	A1 A2 A3 A4 A5	B3 B5 C3 D2

### **Other comments on the Evaluation**

#### **CONSIDERATIONS ON CONTINUOUS ASSESSMENT**

The students will be able to do (depending on the circumstances of the course) a maximum of 3 evaluations that will have a part of questions and a part pf problem solving with which they will be able to get the overall grade. This implies that those students who fail the tests called during the semester will be able to take the first opportunity exam for their recovery.

#### **CONSIDERATIONS ON THE GLOBAL EVALUATION**

In case of waiving the continuous evaluation, an evaluation is proposed that will include 100% of the subject, including a part of questions and another part of problem solving, and that will be carried out on the official date detailed in the calendar of the School of Mining and Energy Engineering.

#### **SECOND CHANCE CONSIDERATIONS**

Those students who have not passed the subject on the first opportunity, both through the continuous evaluation modality and the global evaluation modality, will have the option of taking a second opportunity exam as established in the center's calendar.

Exam Timetable: Exam dates and rooms must be verified in the official webpage of the school:

<http://minaseenerxia.uvigo.es/es/docencia/examenes>

### **Sources of information**

### **Basic Bibliography**

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Python.org, **Python**, <https://www.python.org>, 2023

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Microsoft Corporation, **Cursos Office**, <https://www.microsoft.com/es-es/>, 2023

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The Document Foundation, **Libre Office**, <https://es.libreoffice.org>, 2023

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Tonny, <https://thonny.org>, 2023

### **Complementary Bibliography**

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Tanenbaum, Andrew S.; Wetherall, David J., **Sistemas Operativos modernos**, Pearson Education, 2009

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Silberschatz, Abraham, **Database System concepts**, Springer International Publishing, 2018

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Pérez Cota, Manuel, **Historia de la Informática**, <https://moovi.uvigo.gal>, 2023

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Pérez Cota, Manuel, **Fundamentos de Informática**, Reprogalicia, 2019

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Apple Corporation, **Recursos educativos Apple**, <https://www.apple.com/es/>, 2023

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IBM Corporation, **Recursos informáticos de IBM**, <https://www.ibm.com/es-es/>, 2023

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Wolf, Gunar; Ruiz, Esteban; Bergero, Federico; Meza, Erwin, **Fundamentos de Sistemas Operativos**, UNAM, 2015

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### **Recommendations**

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### **Other comments**

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The form in which the ICTs are used in the development of works for other subjects shall constitute a work for this subject. Doing, in this way, can be achieved better exploitation of the time for the student and it contributes to the best use of the resources.

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