UNIVERSIDADE DA CORUÑA

Teaching Guide				
Identifying Data				2022/23
Subject (*)	Introduction to Computers		Code	614G03012
Study programme	Grao en Intelixencia Artificial			
Descriptors				
Cycle	Period	Year	Type	Credits
Graduate	1st four-month period	First	Basic training	6
Language	Spanish			
Teaching method	Face-to-face			
Prerequisites				
Department	Enxeñaría de Computadores			
Coordinador	Amor Lopez, Margarita	E-mail	margarita.amor@udc.es	
Lecturers	Amor Lopez, Margarita Gonzalez Gomez, Patricia	E-mail	margarita.amor@udc.es patricia.gonzalez@udc.es	
Web				
General description	This subject reveals the fundamentals of the architecture of a computer, its basic operation, how it is programmed in assembly language and how the memory and I/O subsystems are and how they work. In addition, the structure and basic components of an operating system will be shown. On the other hand, the development of efficient codes that take optimal advantage of the hardware resources available in the computer will be presented.			

Study programme competences	
Code	Study programme competences
A4	Conocer la estructura, organización, funcionamiento e interconexión de los sistemas informáticos (computador, sistemas operativos y redes de computadores).
A6	Capacidad para realizar el análisis, diseño, implementación de aplicaciones que requieran trabajar con grandes volúmenes de datos, aplicando arquitecturas hardware/software adecuadas.
B2	Que el alumnado sepa aplicar sus conocimientos a su trabajo o vocación de una forma profesional y posea las competencias que suelen demostrarse por medio de la elaboración y defensa de argumentos y la resolución de problemas dentro de su área de estudio.
B3	Que el alumnado tenga la capacidad de reunir e interpretar datos relevantes (normalmente dentro de su área de estudio) para emitir juicios que incluyan una reflexión sobre temas relevantes de índole social, científica o ética.
B5	Que el alumnado haya desarrollado aquellas habilidades de aprendizaje necesarias para emprender estudios posteriores con un alto grado de autonomía.
C3	Capacidad para crear nuevos modelos y soluciones de forma autónoma y creativa, adaptándose a nuevas situaciones. Iniciativa y espíritu emprendedor.

Learning outcomes			
Learning outcomes	Study programme competences		
Understand the internal workings of a computer and its functional blocks.	A4	B3	
Know the machine language of the computer and be able to develop very simple codes in said language.		B2	
Have the ability to develop codes that take optimal advantage of the hardware resources available on the computer.		B2 B5	C3
Understand the interrelationship between the operating system software and the hardware on which it executes.	A6	B2	C3
Understand the different models of parallel systems and their programming.	A6		

Contents	
Topic	Sub-topic
1.- Introduction to computers and operating systems	- Basic functional blocks of a general purpose computer - Basic concepts of the Operating System - Performance metrics

2.- Information Representation	- Coding of integers - Coding of real numbers - Instruction set
3.- The processor	- Types of processors - Instruction-level parallelism
4.- The memory system	- Memory hierarchy - Cache - Principal memory - Virtual memory
5.- Input/Output	- Basic concepts - I/O Techniques - File systems
6.- Operating system	- Processes - Process control structure - Operating System Services
7- Parallel Systems	- Introduction to parallel systems - Multicore Systems - Shared Memory Systems - Distributed Memory Systems

Planning				
Methodologies / tests	Competencies	Ordinary class hours	Student?s personal work hours	Total hours
Laboratory practice	A4 B2 B3 B5 C3	20	28	48
Guest lecture / keynote speech	A4 A6 B5	30	30	60
Objective test	A4 B2 B3	3	9	12
Problem solving	A4 A6 B2 B3 C3	10	17	27
Personalized attention		3	0	3
(*)The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.				

Methodologies	
Methodologies	Description
Laboratory practice	Activity that allows students to learn and consolidate the knowledge already acquired through practical sessions in the laboratory. This methodology allows exercising and evaluating the A4, B2, B3 and B5 skills. The acquisition of the transversal competence C3 will also be taken into account in these sessions.
Guest lecture / keynote speech	Master sessions will be held on the contents of the agenda, normally as a starting point for the rest of the planned activities. These contents will be focused on the A4 and the A6 competition. The sessions will be focused in such a way as to promote the acquisition of transversal and core competencies of the subject.
Objective test	At the end of the semester there will be an exam that will evaluate the contents of the subject. The test will place particular emphasis on the A5, A6 and B5 skills
Problem solving	Problems will be proposed to the students to solve as personal work. Solutions will be discussed in problem classes. Partial controls will also be carried out during the course. This methodology allows exercising and evaluating the A4, A6, B2 and B3 skills. The acquisition of the transversal competence C3 will also be taken into account in these sessions.

Personalized attention	
Methodologies	Description
Problem solving Laboratory practice	Personalized attention is essential to guide the students in carrying out the proposed problems and for laboratory practices. On the other hand, students will be recommended to attend tutorials as a method of help.

Assessment			
Methodologies	Competencies	Description	Qualification
Problem solving	A4 A6 B2 B3 C3	Problems will be proposed of individual development and their resolution will be evaluated through written controls during the course. These controls are intended to assess the skills A4, B2, B3 and B5.	20
Laboratory practice	A4 B2 B3 B5 C3	The practices carried out by the students during the development of them in the laboratory sessions will be evaluated. With the results of these practices, it is sought to evaluate the A4, B2, B3 and B5 competencies.	20
Objective test	A4 B2 B3	At the end of the semester there will be a written exam on the contents of the subject. This exam will assess the A4, B2 and B3 skills.	60

Assessment comments
At the first opportunity to pass the subject it will be necessary to take the final exam and have a total grade (practices plus controls plus exam) equal to or greater than 50% of the maximum grade.On the second opportunity, the exam grade will be 80% of the total, that is, the entire subject will be evaluated. The practice grade will be the one obtained during the course. For students who present themselves for the early opportunity in December, the practice grade they had obtained in their last course will be used. To pass the subject, the final grade (exam plus practices) must be equal to or greater than 50% of the maximum grade.Fraudulent performance of the tests or evaluation activities will directly imply the qualification of failing '0' in the corresponding test.Students with part-time enrollment will be able to choose the internship group that best suits their schedules, allowing group mobility throughout the course. Those who have been granted the academic waiver that exempts them from class attendance will only have to carry out the practices corresponding to the continuous evaluation.

Sources of information	
Basic	- David A.Patterson and John L. Hennessy (2017). Computer Architecture and Design RISC-V. Morgan Kaufmann Publishers - J. Carretero Pérez, F. García Carballeira, P. de Miguel Anasagasti, F. Pérez Costoya (2007). Sistemas operativos: una visión aplicada. Mc Graw Hill
Complementary	- F. García Carballeira, J. Carretero, J.D. García Sánchez y D. Expósito Singh (2015). Problemas Resueltos de Estructura de Computadores. Paraninfo - M. Beltrán Pardo y A. Guzmán Sacristán. (2010). Diseño y Evaluación de Arquitectura de Computadores. Grupo Anaya Publicaciones Generales - David A. Patterson y John L. Hennessy (2011). Estructura y Diseño de Computadores. Reverté

Recommendations
Subjects that it is recommended to have taken before
Subjects that are recommended to be taken simultaneously
Subjects that continue the syllabus
Other comments

(*)The teaching guide is the document in which the URV publishes the information about all its courses. It is a public document and cannot be modified. Only in exceptional cases can it be revised by the competent agent or duly revised so that it is in line with current legislation.