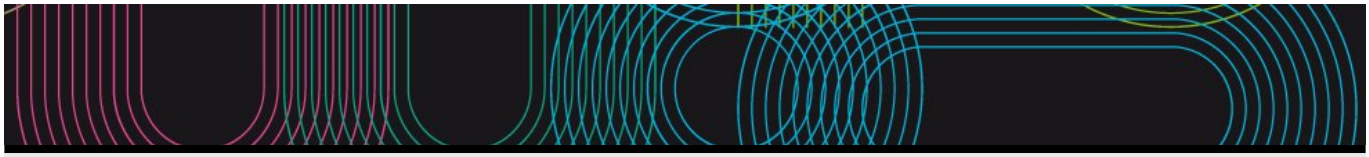

IDENTIFYING DATA				
(*)Informática: Arquitectura de ordenadores				
Subject	(*)Informática: Arquitectura de ordenadores			
Code	V05G300V01103			
Study programme	(*)Grao en Enxeñaría de Tecnoloxías de Telecomunicación			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Basic education	1st	1st
Teaching language	Spanish			
Department				
Coordinator	Llamas Nistal, Martín			
Lecturers	Costa Montenegro, Enrique Gil Solla, Alberto Llamas Nistal, Martín Santos Gago, Juan Manuel Servia Rodríguez, Sandra			
E-mail	martin@uvigo.es			
Web	http://faitic.uvigo.es			
General description	Computers have become an essential tool. This fact is even more clear while studying the "Bachelor of Engineering in Telecommunications Technology" (Grado en Ingeniería de Tecnologías de Telecomunicación), where computers are not only manipulated from a user's --or specialized user's-- point of view, but also from the engineering perspective, as tools to be designed or to be integrated in more complex systems. Hence, the main motivation for the "Computer Architecture" (Arquitectura de Ordenadores) course is to provide students with an understanding of basic computer operation by studying the lower abstraction levels (over the electronic level). The subject "Computer Architecture" (Arquitectura de Ordenadores) is focused on the conventional machine level, describes the operating machine level and shows an example application for the Symbolic Machine domain through the introduction of the Database Management Systems.			

Competencies	
Code	
A3	CG3: The knowledge of basic subjects and technologies that capacitates the student to learn new methods and technologies, as well as to give him great versatility to confront and update to new situations
A4	CG4: The ability to solve problems with initiative, to make creative decisions and to communicate and transmit knowledge and skills, understanding the ethical and professional responsibility of the Technical Telecommunication Engineer activity.
A9	CG9: The ability to work in multidisciplinary groups in a Multilanguage environment and to communicate, in writing and orally, knowledge, procedures, results and ideas related with Telecommunications and Electronics.
A11	CE2/FB2: The basic knowledge about using and programming computers, operative systems, databases and Engineering applied software.

Learning aims	
Expected results from this subject	Training and Learning Results
(*)FB2: Basic knowledge on the use and programming of computers, operating systems, data bases and software applied to engineering.	A11
(*)CG3: Knowledge on basic subjects and technologies, enabling learning new methods and technologies, as well as endowed with the versatility to adapt to new situations.	A3

(*)CG4: Problem-solving capacity with initiative, decision making, creativity, and to communicate and transfer knowledge, skills and abilities, understanding the ethical and professional responsibility of the activity of Telecommunications Technical Engineering	A4
(*)CG9: Ability to work in a multidisciplinary and multilingual environment and to communicate both in writing and orally, knowledge, procedures, results and ideas related to telecommunications and electronics.	A9

Contents

Topic	
(*)1: PRELIMINARIES	(*)Information Representation in computers. von Neumann Model. Structural, procesal and functional models
(*)2. von Neumann Model	(*)Components of von Neumman machine. Simple Machine: Simplez. Central Processing Unit, Arithmetic and Logic Unit, memries, registries, buses. External Communication, active waiting, Introduction to addressing modes
(*)3. Symbolic Representation and Processing .	(*)Representation of basic data elements: integer, character, floating point. Conventions for data storage. Processing operations. Introduction to simbolic processing. Assembler language
(*)4. Instructions and addressing	(*)4. IInstructions and addressing Software considerations. Registries at the conventional machine level. Lenguage for register transfer (RT level). Instruction format. Addressing modes. Stacks and subprograms. Assembler languages
(*)5. Typical conventional machine	(*)Structural Model. Functional Model. Set of instuctions. Addressing modes, Assembler. Examples of programmes. Algortimez
(*)6. Peripheral management	(*)Types of peripherals. Management of variety. Models. Secondary memories. Interruptions. Service Rutines. ADM: justification.
(*)7. Operating Systems	(*)Operative Machine. Introduction to Operating Systems. Definition of an operating system. Interface operating system. Introduction to CPU management. Introduction to memory management. Introduction to file management. Introduction to I/O management.
(*)8. Data Bases	(*)Introduction to Data Bases. Relational Model. Entity-relation model. Query languages. Introduction to SQL

Planning

	Class hours	Hours outside the classroom	Total hours
Laboratory practises	22	27.5	49.5
Introductory activities	5	5	10
Troubleshooting and / or exercises	10	17.5	27.5
Master Session	12	24	36
Self-assessment tests	0	3	3
Practical tests, real task execution and / or simulated.	4	8	12
Short answer tests	3	9	12

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

Methodologies

	Description
Laboratory practises	The course includes programming practices that will performed using a simple computer (SIMPLEZ) and a regular computer (ALGORITMEZ).
Introductory activities	Presentation of the course contents, methodology, office hours, evaluation, usage of the labs, and any other issue related to the subject.
Troubleshooting and / or exercises	Programming, information representation, and other problems and exercises will be solved during the classes. Some must be solved by students previously at home, and they will participate actively in the solution of some other problems.
Master Session	Theoretical concepts and their practical application will be introduced during the classes. Students will be encouraged to participate by alternating lectures with problem and exercise solving. Therefore, sessions will include lectures and time for exercises and problems.

Personalized attention

Methodologies	Description

Master Session	 During lectures, problems and exercises solving classes, and laboratory practice, professors will use teaching methods to attend students personally. This, together with attention tests that will be made during these classes, will allow the professor to have a personalized monitoring of the student. In tutoring hours, all questions related to practices, problem solving sessions and lectures will be solved. Using Continuous Assessment, we will try to identify students with results worse than expected, for mentoring them and find out what has led them to those bad results, and to search for solutions.
Laboratory practises	 During lectures, problems and exercises solving classes, and laboratory practice, professors will use teaching methods to attend students personally. This, together with attention tests that will be made during these classes, will allow the professor to have a personalized monitoring of the student. In tutoring hours, all questions related to practices, problem solving sessions and lectures will be solved. Using Continuous Assessment, we will try to identify students with results worse than expected, for mentoring them and find out what has led them to those bad results, and to search for solutions.
Troubleshooting and / or exercises	 During lectures, problems and exercises solving classes, and laboratory practice, professors will use teaching methods to attend students personally. This, together with attention tests that will be made during these classes, will allow the professor to have a personalized monitoring of the student. In tutoring hours, all questions related to practices, problem solving sessions and lectures will be solved. Using Continuous Assessment, we will try to identify students with results worse than expected, for mentoring them and find out what has led them to those bad results, and to search for solutions.

Assessment

	Description	Qualification
Self-assessment tests	Exam questions will be available for students, in order to perform autoevaluation.	0
Practical tests, real task execution and / or simulated.	Two practical exams will be performed in laboratory.	50
Short answer tests	Three exams (ongoing evaluation) will be performed to evaluate the theory.	50

Other comments on the Evaluation

This subject is organized in two parts: Theory (5 points) and Practice (5 points). To pass the subject, a minimun grade of 2 must be obtained in each part, and the global grade must be over 5.

Being NT the Theory grade and NP the Practice grade:

- If NT ≥ 2 and NP ≥ 2, then the subject grade will be NT+NP.
- If (NT

Sources of information

Gregorio Fernández Fernández, **Curso de Ordenadores. Conceptos básicos de arquitectura y sistemas operativos.**, 5ª,

Silberschatz, H.F. Horth y S. Sudarshan, **Fundamentos de Bases de Datos.**, 2ª,

A. S. Tanenbaum, **Organización de Computadoras. Un enfoque estructurado.**, 4ª,

J.L. Hennessy y D.A. Patterson, **Arquitectura de los Computadores. Un enfoque cuantitativo**,

Alberto Gil Solla, **Ejercicios resueltos sobre Fundamentos de los Ordenadores**, 1ª,

Alberto Gil Solla, **Problemas resueltos de programación en ensamblador**, 1ª,

Fernando A. Mikic Fonte y Martín Llamas Nistal, **Arquitectura de Ordenadores: Problemas de Programación en Ensamblador**, 1ª,

Martín Llamas Nistal, Fernando A. Mikic Fonte y Manuel J. Fernández Iglesias, **Arquitectura de Ordenadores: Problemas y Cuestiones de Teoría**, 1ª,

Recommendations