Materia 4_32: Digital systems

Materia:	Digital systems	ECTS:	15
Descriptores	• Digital electronics, Boolean algebra, Combinational systems, Sequential components, Sequential systems, Registers, Counters, Memories, State machines • Data processing architecture, general purpose computer, machine language programming, assembly language, processor system, memory mapping, input-output • Advanced digital systems design, digital architectures, parallel processing, hardware optimisation, time and area performance study, programmable logic devices, field-programmable logic arrays, verification.		
Objetivos generales	This subject has the objective of introducing digital electronics from the technological perspective (transistors) to the system perspective (description of a complete digital automaton) passing through different levels of abstraction. An overview of data processing systems is provided. The use of digital systems in communications and their applications will be studied.		
Competencia específica	CE 4-32a: Knowledge and application of the fundamentals of hardware device description languages. CE 4-32b: Ability to analyse and design combinational and sequential, synchronous and asynchronous circuits, and to use microprocessors and integrated circuits.		
Resultados de aprendizaje	Interpret specifications of a digital system through the truth table. Manipulate logic functions for simplification using Boolean Algebra. Use combinational circuits to implement logic functions. Select sequential components for the implementation of state-based digital systems. Design digital systems to solve complex problems. Classify the subsystems and components of a microprocessor system. Implement memory maps based on specifications. Organise assembly language instructions to execute algorithms. Connect input/output devices to a computer. Recognise different processing architectures and instruction execution architectures. Design digital systems with data storage and processing capabilities. Interpret the area and time specifications of an electronic design wizard. Implement digital circuits and evaluate their correct operation by means of test benches.		
Métodos de evaluación	• Evaluation: Written open-ended test and Problems • Assessment instruments: Checklists and Rating Scales		