Course unit title:	**Digital Circuits II**		
Course unit code:	AEEE192		
Type of course unit:	Compulsory		
Level of course unit:	Bachelor (1st Cycle)		
Year of study:	1		
Semester when the unit is delivered:	3		
Number of ECTS credits allocated :	5		
Name of lecturer(s):	Dr. Haris Haralambous		
Learning outcomes of the course unit:	1. Analyse latches and flip flops and describe their characteristic and excitation tables. 2. Analyse synchronous sequential circuit operation using different flip-flop types. 3. Design, synchronous sequential circuits (FSM) using different flip-flop types. 4. Identify and convert FSM to different implementations (Mealy-Moore). 5. Analyse and design different register and counter implementations 6. Describe the concept of ASM and interpret ASM charts and their basic building blocks.		
Mode of delivery:	Face-to-face		
Prerequisites:	AEEE191	Co-requisites:	None
Recommended optional program components:	None		
Course contents:	• **Synchronous sequential circuits.** Flip-Flops, flip-flop triggering, state diagrams and equations, excitation tables, state reduction and assignment. Design of circuits such as synchronous counters, sequence detectors, parity generators etc. • **Algorithmic State Machines.** ASM charts and timing considerations. Data processors. Control implementation using decoders, multiplexers and PLAs. Design of circuits to perform arithmetic operations. • **Asynchronous sequential circuits .** Analysis of asynchronous circuits, transition tables, flow tables. Design procedure of asynchronous circuits • **Hardware description languages (VHDL).** Levels of description: Behavioral, register transfer, and gate level. Signals, variables, processes and control structures. Simulation and examples using VHDL.		
Recommended and/or required reading:			
Textbooks:	Morris Mano, *Digital Design*, Prentice Hall, 2002		

References:	Thomas Floyd, *Digital Fundamentals with VHDL*, Prentice Hall, 2003 .
Planned learning activities and teaching methods:	The taught part of course is delivered to the students by means of lectures, conducted with the help of computer presentations. Lecture notes and presentations are available through the web for students to use in combination with the textbooks. Lectures are supplemented with laboratory work carried out at the communications laboratory. During laboratory sessions, students design and simulate simple sequential circuits using computer based emulator.
Assessment methods and criteria:	• Assignments 10% • Tests: 20% • Laboratory Work: 10% • Final Exam 60%
Language of instruction:	English
Work placement(s):	No