Course unit title:	**Digital Circuits I**		
Course unit code:	AEEE191		
Type of course unit:	Compulsory		
Level of course unit:	Bachelor (1st Cycle)		
Year of study:	1		
Semester when the unit is delivered:	2		
Number of ECTS credits allocated :	5		
Name of lecturer(s):	Dr. Haris Haralambous		
Learning outcomes of the course unit:	1. Recognise the advantages of digital over analog systems. 2. Manipulate numbers and arithmetic between commonly used number systems. 3. Implement basic circuits using Binary Logic and Gates. 4. Apply Boolean Algebra and simplify Boolean expressions. 5. Analyse, design and simplify Combinational logic Circuits. 6. Analyse simple sequential circuits.		
Mode of delivery:	Face-to-face		
Prerequisites:	None	Co-requisites:	None
Recommended optional program components:	None		
Course contents:	• **Introductory Digital Concepts**: Analogue/Digital systems, definitions, advantages of Digital systems. • **Number Systems:** Decimal, binary, Sign Magnitude, Hexadecimal, 1's and 2's complement, calculations. • **Boolean Algebra and Logic Simplification**: Rules of Boolean Algebra, De Morgan's theorem, Simplification guidelines and examples. • **Logic Gates**: OR, AND, NOR, NAND, NOT, XNOR, XOR, Truth table and Boolean expression corresponding to each gate. • **Combinational Logic**: design of circuits, simplification with the use of K-Maps, SOP, POS design. • **Combinational Logic building blocks:** Adders, Encoders, Decoders, Comparators. • **Sequential logic circuits**: Flip-flops.		
Recommended and/or required reading:			
Textbooks:	Thomas L. Floyd, Digital Fundamentals with VHDL, Prentice Hall, 2003.		
References:	• Morris Mano, "Digital Design", Prentice Hall.,2002. • Wakerly John, "Digital Design Principles and Practices" , Prentice Hall, 2001.		

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 perform individual or small group experiments performed with digital boards. Experiments include analysis and simplification of simple digital circuits and analysis of operation of digital combinational and sequential building blocks such as adders, decoders and flip-flops.
Assessment methods and criteria:	• Assignments 10% • Tests: 20% • Laboratory Work: 10% • Final Exam 60%
Language of instruction:	English
Work placement(s):	No