



Course Syllabus

Course Code	Course Title	ECTS Credits
ECE-111	Digital Systems Lab	2
Prerequisites	Department	Semester
ECE-110	Engineering	Fall, Spring
Type of Course	Field	Language of Instruction
Required	Engineering	English
Level of Course	Lecturer(s)	Year of Study
1 st Cycle	Dr Stelios Neophytou	1 st
Mode of Delivery	Work Placement	Corequisites
Face-to-face	N/A	None

Course Objectives:

The main objectives of the course are to:

- Provide basic hands-on experience regarding digital circuits and digital concepts.
- Describe the basic implementation procedure of digital circuits
- Describe basic design and analysis concepts.
- Provide ability of using medium scale integration circuits to as well as computer software to built basic digital structures.

Learning Outcomes:

After completion of the course students are expected to be able to:

- Demonstrate the basic structure of a Medium Scale Integration (MSI) digital integrated circuit (IC) holding basic digital components (i.e, gates, flip-flops etc)
- Review the usage of data sheets of ICs.
- Analyze and utilize components to build combinational digital circuits that implement Boolean expressions.
- Analyze and utilize components to built sequential digital circuits.
- Identify and use the logic probe and logic pulser for troubleshooting.
- Analyze a digital circuit and test for correct functionality.
- Use computer software for designing, simulating and analyzing digital circuits.
- Identify the basic concepts of Hardware Description Languages and their basic structure.
- Utilize both behavioral and structural VHDL to design and simulate digital circuits.

Course Content:

- The Logic probe and the logic pulser;
- Digital circuit analysis and troubleshooting.
- Design of combinational logic circuits.
- Introduction of R-S latch as well as D, and J-K type flip-flops.
- Design of sequential logic circuits.
- Design and analysis of synchronous and asynchronous counters.
- Design and analysis of shift registers and parallel registers.
- Overview of HDL representation and implementation using Programmable Logic Devices.
- VHDL and schematic design entry tools for the design, simulation, verification and performance evaluation of digital logic.
- Realization and testing of combinational and sequential digital circuits, logic circuits by programming FPGAs.
- Final design projects include digital circuits consisting of multiplexers, decoders, counters, memories, etc.

Learning Activities and Teaching Methods:

Lab Presentations and Tutorials, Lab Assignments, Project.

Assessment Methods:

Lab Reports, Mid-Term, Project, Final Exam.

Required Textbooks / Readings:

Title	Author(s)	Publisher	Year	ISBN
Engineering Department, University of Nicosia.	Laboratory manual with a set of experiments.		2008	
XILINX	ISE 10.1 Quick Start and In-Depth Tutorials		2008	

Recommended Textbooks / Readings:

Title	Author(s)	Publisher	Year	ISBN
Morris M. Mano, Charles R. Kime	Logic and Computer Design Fundamentals	Prentice Hall	2007	013198926X
M. M. Mano, M. D. Ciletti	Digital Design, 4th Edition	Prentice Hall	2006	0131989243
T. L. Floyd	Digital Fundamentals with VHDL	Pearson Prentice Hall	2002	0130995274