

COURSE PROFILE

Course Number : EE240	Course Title : Logic Circuit Design
Required / Elective : Required	Pre-requisite : -
Catalog Description: Number systems. Boolean algebra, logic networks and their simplification. Logic design with gates. MSI and LSI technologies. Combinatorial circuits, sequential circuits. Counters, shift registers, arithmetic logic, memory and control units.	Textbook / Required Material : Digital Design, M. Morris Mano, Michael D. Ciletti, Prentice-Hall, 4th edition, ISBN: 13-9780131989245
Course Structure / Schedule : (3+1+0) 3 / 6 ECTS	
Extended Description : Number Systems and Conversion, Binary Codes, Boolean Algebra and Logic Gates, Minimization of Logic Functions with Karnough Maps, Minimization of Logic Functions with Quine-McCluskey, Multi-Level Gate Circuits, Design of Two-Level Circuits Using NAND and NOR Gates, Analysis and Design Procedure of the Combinational Logic Circuits (Systems), MSI/LSI/VLSI Level Implementation of Logic Functions, Sequential Logic Circuits, Design of Synchronous Sequential Logic Circuits, Registers and Counters.	
Design content : Sequential circuit desing (counters), Mealy and Moore machines	Computer usage: Design packages/software
<p>Course Outcomes:</p> <p>Students will add to their knowledge-base in the fundamentals of mathematics, especially in the area of Boolean algebra. Students will comprehend different number systems including the binary system and Boolean algebraic principles. [2]</p> <p>Students will have an ability to identify, formulate, and solve engineering problems related to digital system design. [6]</p> <p>Students will be able to synthesize a given system starting with problem requirements, identifying and designing the building blocks, and then integrating blocks designed earlier. Students will also get an ability to analyze a given digital system and decompose it into logical blocks involving both <i>combinational</i> and <i>sequential circuit</i> elements. [7]</p> <p>Students will use the design packages and softwares to validate the results of the digital circuits they designed. [11]</p> <p>Level of contribution of course to program outcomes: Strong: 6, 7 Average: 11 Some: 2</p>	
<p>Recommended reading: Fundamentals of Logic Design, Charles H. Roth, Jr., Thomson-Nelson, ISBN:0-495-07308-3.</p> <p>Contemporary Logic Design, Randy H. Katz, Benjamin/Cummings Publishing, ISBN:0-8053-2703-7.</p>	
<p>Teaching Methods:</p> <p>Pre-readings, lecture, individual exercises and group work.</p>	
<p>Assessment Methods: [Related to course objectives]</p> <p>Quizzes, Midterm, Homework, Final</p>	

Student Workload:

Preparatory reading	66 hrs
Lectures	42 hrs
Problem sessions, discussions	14 hrs
Midterms	3 hrs
Quizes	4 hrs
Homeworks	18 hrs
Final Exam	3 hrs
TOTAL	150 hrs ... to match 25 x 6 ECTS

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