0

Department of Computer Engineering	
Digital Ciruits I (66222)	
Total Credits	**3**
major compulsory	
Prerequisites	P1 : General Physics II (22102)

Course Contents

Topics covered includes: Arithmetic system, basic gates, k-map, SOP, POS, ROM, multiplexers, flip-flops, adders, decoders, encoders, synchronous sequential circuits, algorithmic state machine, and an introduction to TTL and CMOS families.

	Intended Learning Outcomes (ILO's)	Student Outcomes (SO's)	Contribution
1	Ability to solve problems in binary , octal and hexadecimal system and coding in general	A	15 %
2	Knowledge and understanding of digital circuits fundamentals necessary to analyze and design complex digital devices, and Use Boolean logic and k-maps to minimize Boolean expressions	K	35 %
3	Design and use major digital combinational components such as multiplexers, decodes, and ROMS	K	25 %
4	Design and analyze sequential circuits	K	20 %
5	Overview of TTL and CMOS logic gates characteristics.	K	5 %

Textbook and/ or Refrences

Digital Design , 4th edition By Morris Mano.

Assessment Criteria	Percent (%)
First Exam	25 %
Second Exam	25 %
Final Exam	50 %

Course Plan

Week	Topic
1	Introduction to Digital circuits and Boolean logic
2- 3	Digital Logic Circuits (Binary number representation ,Codes , Data representation , Logic circuits gates, Boolean Algebra)
4	Combinational Logic (Laws and theorems of Boolean Algebra , Universal gates (NAND/NOR), Simplification of Boolean Expressions)
5- 6	Combinational Logic (Analysis Procedure, Design Procedure ,Binary Adder Subtractor)
6	First exam
7	Encoders / Decoders
7	Multiplexers / Demultiplexers
8- 10	Sequential Logic (Flip-Flops ,Sequential circuits ,Design Procedure)
11- 13	Arithmetic Circuits and Sequential Logic Devices (Registers ,Counters ,Adders ,Memory Unit ,Programmable Logic)
13	Second exam
14	Finite State Machine Design (Design &Implementation ,Register &Control Logic ,Practical examples)
15	Transistor-Transistor Logic (TTL) circuits (Resistor-Transistor Logic (RTL), Diode - Transistor Logic (DTL), Modified Diode-Transistor Logic ,Basic Transistor-Transistor

	Logic, Standard Transistor-Transistor Logic (TTL))
16	CMOS circuits
16	Final exam