FUTURE UNIVERSITY IN EGYPT جامعة المستقبل

Faculty of Computers and Information Technology

Logic Design

Information :

Course Code :	CSC 111	**Level :**	Undergraduate	**Course Hours :**	3.00- Hours

Department : Faculty of Computers and Information Technology

Instructor Information :

Title	Name	Office hours
Lecturer	Amal Safwat Mehanna	2
Assistant Lecturer	Salma Radwan Hassan Abdelhamid	6

Area Of Study :

Understand the basic differences between analog and digital systems.
Understand and use binary numbers and codes.
Understand and describe the operation of logic gates.
Understand and apply Boolean algebra.
Understand and use Karnaugh maps for Logic Simplification.
Find minimum terms using Tabular method.
Design combinational and sequential logic circuits.
Use Flip Flops and related devices.
Design universal shift registers.

Description :

Basic logic concepts: Logic states, number systems, Boolean algebra, basic logical operations, gates and truth tables. Combinational logic: Minimization techniques, multiplexers and de-multiplexers, encoders, decoders, adders and subtractors, comparators, programmable logic arrays and memories, design with MSI, logic families, tri-state devices. Sequential logic: Flip flops, mono-stable multi-vibrators, latches and registers. , Counters .

Course outcomes :

a.Knowledge and Understanding: :	
1 -	Describe the concept of different number systems
2 -	Define the different types of logic gates and logic functions
3 -	Explain the concept of Boolean functions and Boolean algebra
4 -	Explain the concept of sequential logic circuits.
5 -	Define different types of flip-flops and latches.
6 -	Identify different types of computer memories and their arrangements.
7 -	Discuss different types of prefabricated integrated circuits and logic families.
8 -	Describe basic knowledge and understanding of fundamental principles of computer architectures how these support IT-based applications
b.Intellectual Skills: :	
1 -	Simplify logic circuits using Boolean algebra and Karnaugh maps

2 -	Design simple logic circuits
3 -	Analyze and design simple sequential circuits
4 -	Perform comparisons between (methods, techniques...etc).
5 -	Summarize the proposed solutions and their results.
6 -	Establish criteria, and verify solutions.
7 -	Identify attributes, components, relationships, patterns, main ideas, and errors
8 -	Identify a range of solutions and critically evaluate and justify proposed design solutions.
c.Professional and Practical Skills: :	
1 -	Use MSI circuits to design logic circuits
2 -	Use programmable devices (ROM, PAL, PLA, ...) to design simple logic circuits
3 -	Evaluate systems in terms of their quality and possible trade-offs, evaluate appropriate hardware solutions for given scenarios.
4 -	. Identify any risks or safety aspects that may be involved in the operation of computing equipment within a given context.
5 -	Recognizing the logical and physical properties of computing equipments
d.General and Transferable Skills: :	
1 -	Communicate effectively by oral, written and visual means.
2 -	Work effectively as an individual and as a member of a team.
3 -	Lead and motivate individuals.
4 -	Manage tasks and resources
5 -	Manage one's own learning and personal and professional development.

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
Introduction to Digital and Analog Systems, number systems.	3	2	2
Logic gates (AND, OR, INVERTER, NOR, NAND, XOR, and XNOR).	3	2	2
Logic gates (AND, OR, INVERTER, NOR, NAND, XOR, and XNOR).	3	2	2
Tabular method (QuineMcClusky).	3	2	2
Mid-Term1	2	1	2
Introduction to Combinational Logic Circuits.	3	2	2
Half-Adder, Full-Adder, Half-Subtractor, Full-Subtractor, Parallel Adder.	3	2	2
Comparator, Decoder, Encoder, Code converter (ROM), Encoder.	3	2	2
Multplexer, Demultiplexer.	3	2	2
Latches and Flip Flops,	3	2	2
Mid-Term 2	2	1	2
Counters, Frequency Divider.	3	2	2
Counters, Frequency Divider.	3	2	2
Shift Registers.	3	2	2
Final Exam	3	2	2

Teaching And Learning Methodologies :
Lectures
Exercises
Projects

Course Assessment :

Methods of assessment	Relative weight %	Week No	Assess What
Attendance	10.00	2	
Final Exam	40.00	15	
Lab	20.00	2	
Mid Term Exam II	15.00	12	
MidTerm Exam I	15.00	6	