Future Academy
Higher Future Institute for Specialized Technological Studies

Course Specification

1- Course information:	
Course Code:	CSC201
Course Title:	Digital Logic design
Year/level	2nd
Academic Programs	Computer Science Program (B.Sc.)
Contact hours/ week	Theoretical = 2hrs, Practical = 2hrs), Total= 4hrs

2- Course aims:

These course covers the basic logic concepts: Logic states, number systems, Boolean algebra, basic logical operations, gates and truth tables, Karnaugh Maps. Combinational logic: Minimization techniques, multiplexers, encoders, decoders, adders and sub-tractors, comparators. Sequential logic: Flip flops, latches and registers.

3- Intended learning outcomes of the course (ILOs):

a- Knowledge and understanding:

On successful completion of this course, the student should be able to:
a-1 Recognize the fundamental ideas, facts, and theories pertaining to information, computers, and computer applications for digital logic concepts.
a-2 Recognize the requirements and criteria that apply to particular digital circuits and develop solutions strategies.
a-3 Defines the appropriate mathematical tool and simulation design for understanding digital logic circuits

b- Intellectual skills:

On completing this course, the student should be able to:
b1- Apply and evaluate the ideas, principles, theories, and methods for logic circuit analysis and design.
b2- Compare, suggest, and assess alternative digital circuit analysis and procedures considering restrictions and quality constraints .
b3- Create concepts, plans, and designs for the appropriate Logic circuit modeling of a given problem

c- Professional and practical skills:

At the end of this course, the student will be able to:

c1- Analyze your thorough understanding of digital circuit analysis to projects and the use of simulation techniques to solve real-world issues .
c2- Show an innovative and creative design for a digital circuit using appropriate design tools.

d- General and transferable skills:

On successful completion of this course, the student should be able to:
d-1 Manage suitable numeracy abilities to understand the concepts of Logic analysis and design.
d-2 Manage how to use general computing resources.

4- Course contents

Week No.	Topics/units	Number of hours		ILO's
		Lecture hours	Practical hours	
1	Introduction to number systems	2	2	a1
2	Negative numbers representations	2	2	a1,b1,d1
3	Boolean algebra	2	2	a2,b1,d1
4	Logic gates and circuits + Quiz 1	2	2	a2,b2,c1,d1
5	3 variable K-Map	2	2	a2,b1,b2,c1,d1
6	4 variable K-Map	2	2	a2,b1,b2,c1,d1
7	Mid-Term			
8	Combinational logic circuit analysis	2	2	a2,b2,b3,c2,d2
9	Combinational logic circuit design	2	2	a3,b2,b3,c1,c2,d2
10	Multiplexers, Decoders, and comparator	2	2	a3,b3,c2,d2
11	Latches and Flip Flop + Quiz 2	2	2	a3,b2,c2,d2
12	Sequential logic circuit analysis	2	2	a2,a3,b3,c1,d1
13	Shift register, Final Revision	2	2	a3,b2,c2,d1
14	End-of-semester exam			

5- Teaching and learning methods

Methods	ILO's																			
	a1	a2	a3	a4	a5	b1	b2	b3	b4	b5	c1	c2	c3	c4	c5	d1	d2	d3	d4	d5
Lectures	√	√	√			√					√	√								
Practical sections							√	√			√	√				√	√			
Self-learning						√						√				√				
Assays and reviews																				
Discussion groups						√	√				√					√				
Brainstorming																				
Blended-learning																				
E-learning																				

6- Teaching and learning methods for Low-achieving students

- Extra teaching hours for those who need help
- More quizzes to assess their ability to understand the course
- Encourage the teamwork for those students with other advanced ones to increase their participation and understanding

7- Student assessment

Assessment method	Time	Grade weight (%)	Week	ILOs
Course Work (Tutorial Exercise and Assignments)	Through the semester	10	Every week	
Quiz 1	Through the lecture	5	Week#4	
Mid-term exam	1 hour	10	Week#7	
Quiz 2	Through the lecture	5	Week#11	
Practical Exam	2 hours	10	Week#14	
Final Written exam	2 hours	60	Week#15-16	

8-List of references

8.1. Student notebooks:

- Comprehensive instructor notes ("Power Points Slides") are available on the course web page ("Google Classroom").

8.2. Essential textbooks:

- Thomas l. Floyd, "DIGITAL FUNDAMENTALS Ninth Edition", 2006.

8.3. Recommended textbooks:

- Modern Digital Electronics by **R.P. Jain.**

8.4. Journals, Periodical and Reports ……..etc.

8.5. Websites

- https://www.geeksforgeeks.org/digital-electronics-logic-design-tutorials/
- https://circuitverse.org/

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