COURSE DESCRIPTIONS

Faculty	Science and Information Technology				
Department	Computer Science			**NQF level**	6
Course Title	Digital Logic Design	**Code**	501293	**Prerequisite**	185101
Credit Hours	3	**Theory**	3	**Practical**	0
Course Leader	Dr. Mohammad Al Refai	**email**	m.alrefai@jadara.edu.jo		
Lecturers	Prof. Belal Zaqaibeh	**emails**	zaqaibeh@jadara.edu.jo		
Lecture time	10:00- 11:30	**Classroom**	D406 & D002		
Semester	3rd 2022/2023	**Production**	2010	**Updated**	2023

Short Description

This course gives the students a good understanding of the basic tools used in digital design, Number systems, base conversion, and data representation using binary codes, Boolean algebra and its laws, theorems, and operations, Simplification of Boolean algebraic expressions, Converting a word description of a logic system behavior into an algebraic expression, Minimizing, design and analysis of combinational logic, Implementing logic functions using multiple-output networks such as Multiplexers, Decoders, Design and analysis of synchronous sequential logic and flip-flops basics..

Course Objectives

- To let students, acquire knowledge and understand basics of digital design.
- Promote students' skills to gather and analyze digital circuits.

Learning Outcomes

A. Knowledge - Theoretical Understanding

a1. Explain the behavior of combinational and sequential digital circuits. (K1)

B. Knowledge - Practical Application

a2. Demonstrate various digital circuits such as decoders, multiplexers, and flip-flops. (K2)

C. Skills - Generic Problem Solving and Analytical Skills

b1. Develop functionality of various digital circuits using Karnaugh map, and approaches to simplifying logic circuits. (S1)

D. Skills - Communication, ICT, and Numeracy

b2. Determine logic design methodologies and techniques for the solution of Computer Hardware Problems. (S2)

E. Competence: Autonomy, Responsibility, and Context

Teaching and Learning Methods
• (Lectures and problem solving)
Assessment Methods
• Quizzes and Assignments • Midterm exam, Final exam

Course Contents					
Week	**Hours**	**CLOs**	**Topics**	**Teaching & Learning Methods**	**Assessment Methods**
1, 2	6	a1	Syllabus, Course Schedule; Chapter 1: **Digital Systems and Binary Numbers**: Digital systems, Number systems, Negative number representation, Unsigned/signed addition, Operations on Signed Binary Numbers, Binary Codes, Binary Storage and Binary Logic.	Distance E Learning	
4-5	6	a1, b1	Chapter 2: **Boolean Algebra and Logic Gates**: Basic Theorems and Properties of Boolean Algebra, Boolean Functions, Truth table, Canonical and Standard Forms, Digital Logic Gates.	Distance E Learning	
6-8	9	a1	Chapter 3: **Gate Level Minimization**: Karnaugh map, The Map Method, Two, Three and Four Variable K-Map, Product of Sums Simplification, Don't Care Conditions, NAND and NOR Implementation.	Distance E Learning	
MIDTERM EXAM					
9-11	9	b1, b2	Chapter 4: **Combinational Logic**: Analysis Procedure, Design Procedure, Binary Adder-Subtractor, Decoders and Multiplexers.	Distance E Learning	
12-15	12	a1, b2	Chapter 5: **Synchronous Sequential Logic**: Sequential Circuits, Storage Elements: Latches, Storage Elements: Flip Flops, Analysis of Clocked Sequential Circuits, State Reduction and Assignment and Design Procedure.	Distance E Learning	
Final EXAM					

Infrastructure	
Textbook	Digital Design: 5th (fifth) Edition by Mano, M. Morris, Ciletti, Michael D., 2012
References	
Required reading	

Electronic materials	
Other	

Course Assessment Plan							
Assessment Method		**Grade**	**CLOs**				
			a1	**a2**	**b1**	**b2**	
Midterm)		30	10	6	8	6	
Final Exam		50	22		14	14	
Coursework		20					
Coursework assessment methods	Assignments						
	Case study						
	Discussion and interaction						
	Group work activities						
	Lab tests and assignments						
	Presentations						
	Quizzes			10		10	
Total		**100**	32	16	22	30	

Plagiarism
Plagiarism is claiming that someone else's work is your own. The department has a strict policy regarding plagiarism and, if plagiarism is indeed discovered, this policy will be applied. Note that punishments apply also to anyone assisting another to commit plagiarism (for example by knowingly allowing someone to copy your code). Plagiarism is different from group work in which a number of individuals share ideas on how to carry out the coursework. You are strongly encouraged to work in small groups, and you will certainly not be penalized for doing so. This means that you may work together on the program. What is important is that you have a full understanding of all aspects of the completed program. In order to allow proper assessment that this is indeed the case, you must adhere strictly to the course work requirements as outlined above and detailed in the coursework problem description. These requirements are in place to encourage individual understanding, facilitate individual assessment, and deter plagiarism.