Jadara University		جـــامـــعـــة جـــدارا

COURSE DESCRIPTIONS

Faculty	Science and Information Technology				
Department	Computer Science			**NQF level**	7
Course Title	**Computer Organization and Architecture**	**Prerequisite**	**501305**	**Prerequisite**	185101
Credit Hours	3	**Theory**	3	**Practical**	0
Course Leader		**email**			
Lecturers	Dr. Aymen Abu-Errub	**email**	a.abu-errub@jadara.edu.jo		
Lecture time	Multiple Sections	**Classroom**	**Blended**		
Semester	First 2025-2026	**Production**	2020	**Updated**	2024/2025
Types of Teaching	☒ **Face-to-Face** ☐ **Online** ☐ **Blended**				

Course Description and Overview

This course aims to provide students of computing with understanding of digital computer system's components, their characteristics, and their performance. It is important to understand Computer Architecture and Organization in order to structure a program so that it runs efficiently on a real machine. And when selecting a system to use, it is important to understand the tradeoff among various components, so you can accurately compare competing systems, and understand technical literature on new computer systems. This course will cover the basic concepts of Computer Architecture that are important to understand, including the CPU, memory systems including caching memory, and input/output subsystems.

Course Objectives

- To let students, acquire basic concepts of computer architecture and organization understanding and computer system design.
- Introduce memory used in modern computers and how to evaluate digital computer components.

Learning Outcomes

A. Knowledge - Theoretical Understanding

a1. **Define** the basic components of a digital computer, operations of the computer and concepts involved with Computer Architecture and Organization. (K1)

B. Knowledge - Practical Application

a2. **Solve** instruction set, mapping function, replacement and arithmetic problems. (K4)

C. Skills - Generic Problem Solving and Analytical Skills

b1. **Analyze** a computer system's expected performance. (S1)

D. Skills - Communication, ICT, and Numeracy

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	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.	Face to face Lectures	
3-5	**9**	a1, a2	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.	Face to face Lectures	Quiz Assignment
6-8	**9**	a1, a2 b1	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.	Face to face Lectures	Quiz Assignment
MIDTERM EXAM – as Assessment Method					
9-11	**9**	a1, a2 b1	Chapter 4: **Combinational Logic:** Analysis Procedure, Design Procedure, Binary Adder–Subtractor, Decoders and Multiplexers.	Face to face Lectures	
12-15	**9**	a1, a2 b1	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.	Face to face Lectures	Quiz Assignment
FINAL EXAM – as Assessment Method					

	Infrastructure

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Textbook	Digital Design: 5th (fifth) Edition by Mano, M. Morris, Ciletti, Michael D., 2013
References	
Required reading	
Electronic materials	
Other	

Course Assessment Plan					
Assessment Method		**Grade**	**CLOs**		
			a1	**a2**	**b1**
Midterm		30	10	12	8
Final Exam		50	20	22	8
Coursework		20			
Coursework Assessment Methods	Assignments	5	2	2	1
	Case study				
	Discussion and interaction	5	2	2	1
	Group work activities				
	Lab tests and assignments				
	Presentations				
	Quizzes	10	4	3	3
Total		**100**	**38**	**41**	**21**

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.