

COURSE DESCRIPTIONS

Faculty	Science and Information Technology				
Department	Computer Science			NQF level	7
Course Title	Computer Organization and Architecture	Code	501305	Prerequisite	501293
Credit Hours	3	Theory	3	Practical	0
Course Leader	Dr. Loiy Alsbatin	email	l.alsbatin@jadara.edu.jo		
Lecturers	Dr. Loiy Alsbatin	emails	_____		
Lecture time	10:00- 11:30	Classroom	Blended		
Semester	Second	Production	2010	Updated	2023/2024

Short Description

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** main memory 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
<ul style="list-style-type: none"> Lecture, lab, Group work, and discussion
Assessment Methods
<ul style="list-style-type: none"> Lecture, lab, Group work, and discussion Midterm exam, Final exam, Class Assignment Observation of student contribution in team work

Course Contents					
Week	Hours	CLOs	Topics	Teaching & Learning Methods	Assessment Methods
1	3	a1	Syllabus, Course Schedule; Chapter 1: Introduction: Organization and Architecture, Structure and Function	Blended	
2	3	a1	Chapter 2: Computer Evolution and Performance: A Brief History of Computers, Designing for Performance, The Evolution of the Intel x86 Architecture.	Blended	
3, 4	6	a1	Chapter 3: A Top-Level View of Computer Function and Interconnection: Instruction Cycle, Computer Components and Function, Interconnection Structures, and Addressing.	Blended	Assignment
5, 6	9	a1, a2 b1	Chapter 4: Cache Memory: Computer Memory System Overview, Cache Memory Principles and Elements of Cache Design. Replacement Algorithms (FIFO and LRU)	Blended	Assignment
7, 8	3	a1, a2 b1	Chapter 10: Computer Arithmetic: The Arithmetic and Logic Unit (ALU), Integer Representation and Arithmetic, Booth's Algorithm.	Blended	Assignment
MIDTERM EXAM					
9, 10	6	a1, a2 b1	Chapter 12: Instruction Sets: Characteristics and Functions: Machine Instruction Characteristics, Types of Operands and Types of Operations, Instruction Formats.	Blended	Assignment
11, 12	6	a1, a2 b1	Chapter 13: Instruction Sets: Addressing Modes and Formats: Addressing Modes and Formats Pipelining Basics, Throughput and Speedup of Pipelining	Blended	Assignment
13, 14	6	a1, a2 b1	Chapter 14: Processor Structure and Function: System Bus, Status bits, Processor Organization, Register Organization, Instruction Cycle and interrupts.	Blended	Assignment
Final EXAM					

Infrastructure	
Textbook	Computer Organization and Architecture 10 th Edition, William Stallings 2016
References	Computer Organization and Architecture 11 th Edition, William Stallings 2022
Required reading	
Electronic materials	
Other	

Course Assessment Plan						
Assessment Method	Grade	CLOs				
		a1	a2	b1		
Midterm)	30	10	10	10		
Coursework	20	6	10	4		
Final Exam	50	20	20	10		
Coursework assessment methods	Assignments					
	Case study					
	Discussion and interaction					
	Group work activities					
	Lab tests and assignments					
	Presentations					
	Quizzes					
Total	100	36	40	24		

Plagiarism
<p>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).</p> <p>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.</p>