FUTURE UNIVERSITY IN EGYPT جامعة المستقبل

Faculty of Computers and Information Technology

Computer Architecture

Information :

Course Code :	CS312	**Level :**	Undergraduate	**Course Hours :**	3.00- Hours

Department : Department of Computer Science

Instructor Information :

Title	Name	Office hours
Associate Professor	Khaled Ahmed Mohamed Elshafey	8
Teaching Assistant	Fatmaelzahra Hamdi Abdallah Mohamed	
Teaching Assistant	Nada Emad Abdelsalam Hussien	
Teaching Assistant	Farah Ashraf Wafaa Mahmoud	
Teaching Assistant	Ahmed Mohamed Nasr Abdel Latif El Dafrawy	

Area Of Study :

Develop and evaluate basic computer and accumulator logic.
Use all available principles and practices used in the design and analysis of a digital computer system.
Show a complete understanding of micro-programs and control unit.
Understand knowledge that enhances skills in parallel processing.
Compare and evaluate different functional units (bus system, memory unit, central processing unit, and input/output), and evaluate the techniques that control memory and address sequencing.

Description :

Sequential logic: flip-flops, registers. Microprocessors, computer instructions, interrupts, design of basic computer, control unit design, micro programming, parallel processing.

Course outcomes :

a.Knowledge and Understanding: :	
1 -	Discuss the fundamental concepts of computer architecture.
2 -	Explain the principles and techniques of transferring data in computer system and the required computer instructions.
3 -	Outline the main types of interrupts showing the principles of memory control and parallel processing.
b.Intellectual Skills: :	
1 -	Analyze different problems in designing a basic computer.
2 -	Propose a set of alternative solutions for bus system.
3 -	Select appropriate methodologies and techniques for sequential and parallel processing.
c.Professional and Practical Skills: :	
1 -	Apply effective information to implement arithmetic and shift micro-operations.
2 -	Deploy effective supporting tools to apply memory reference instructions to manage real memory.

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3 -	Create technical reports according to professional standards.
d.General and Transferable Skills: :	
1 -	Work on a team for the development of a requirements document.
2 -	Apply communications skills in presentation and report writing of requirements engineering deliverables.

ABET Course outcomes :	
1 -	Analyze different problems in designing a basic computer.
2 -	Select appropriate methodologies and techniques for sequential and parallel processing
3 -	Use available principles and practices used in the analysis and design of a digital computer system.
4 -	Demonstrate understanding of micro-programmed control unit.
5 -	Compare and evaluate different functional units (bus system, memory unit, central processing unit, and input/output).

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
Latches, Flip Flops	4	2	2
Registers, Counters	4	2	2
Register Transfer Language, Bus and Memory Transfer	4	2	2
Arithmetic Micro-operations, Logic Micro-operations, Shift Micro-operations	4	2	2
Instruction Codes, Computer Registers	4	2	2
Computer Instructions, Timing Cycle	4	2	2
Instruction Cycle, Memory Reference Instructions	4	2	2
Input-Output and Interrupt	4	2	2
Mid-Term Exam	2		
Design of basic computer, Design of accumulator logic	4	2	2
Control memory, Address sequencing	4	2	2
Micro-program, Control unit	4	2	2
Parallel Processing, Memory Hierarchy	4	2	2
Final Exam	2		

Teaching And Learning Methodologies :
Interactive Lectures including Discussions
Tutorials
Practical Lab Sessions
Self-Study (Project / Reading Materials / Online Material / Presentations)
Problem Solving

Course Assessment :

Methods of assessment	Relative weight %	Week No	Assess What
Assignments	10.00	4	

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Final Exam	40.00	14	
Midterm Exam (s)	20.00	9	
Quizzes	20.00	5	
Team Work Projects	10.00		

Course Notes :

An Electronic form of the Course Notes and all the slides of the Lectures is available on the Students Learning Management System (Moodle)

Recommended books :

Mostafa Abd-El-Barr, Hesham El-Rewini, Fundamentals of computer organization and architecture, John Wiley & Sons, latest edition.

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