



Future Academy Higher Future Institute for Specialized Technological Studies

Course Specification

1- Course information:	
Course Code:	CSC 222
Course Title:	Computer Architecture
Year/level	2 nd
Academic Programs	Computer Science Program (B.Sc.)
Contact hours/ week	(Theoretical = 2 hrs – Practical = 2 - Tutorial = 1 hrs) Total = 3 hrs

2- Course aims:

This course aims to provide students with principles and theories relevant to the structure and function of computer components, principles of generating tests which investigate the functionality of computer components and evaluating their function at the register level. Provide students with skills to analyze, propose and evaluate alternative computer processes taking into account limitations, and quality constraints in computer components using assembly language. Provide students with skills to Operate processor components, recognizing its logical and physical properties, capabilities and limitations using assembly language.

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 Identify essential facts and concepts, related to computer components.

a-2 Outline theories of top-level view of computer function and Interconnection.

a-3 Define the characteristics and practices needed for designing the memory. a6. Identify tools, and practices needed for implementing processor components.

a-4 State principles of generating tests that investigate the functionality of assembly programs.

b- Intellectual skills:

On completing this course, the student should be able to:

b-1 Recognize the internal components of a processor, recognizing its logical and physical properties, capabilities, and limitations .

b-2 Apply comprehensive computing knowledge and skills in assembly programs .

b-3 Discuss processor architecture by using processor equipment to apply assembly programs. **c-Professional and practical skills:**

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

c-1 Investigate Computer Function and Interconnection

c-2 Interpret the internal structure of processor specifications and functionality taking into account limitations, and quality constraints of registers .

c-3 Examine the Data and conditional processing in the processor architecture of cache memory.

d- General and transferable skills:

On successful completion of this course, the student should be able to:

d-1 Make use of a wide range of learning resources and manage self-learning for computer organization d-2 Work in groups and manage team, time, and organizational skills to apply for assembly programs.

4- Course contents

		Numbe	r of hours	ILO's			
Week	Topics/upits	Lecture	Practical				
No.	Topics/units	hours	/ Tutorial				
			hours				
	Basic computer organization and						
1	design: Computer instructions	2	3	o1 b1			
	and their codes, timing and		3	a1,01			
	control, execution of instructions.						
2	Input, output and interrupt.	2	3	a1.a2.b1.b2.c1.d1			
		-		u1,u2,01,02,01,u1			
	Assembly language:						
3	Programming loops,	2	3	a3,b1,b2			
	programming arithmetic & logic						
	operations.						
	Programming arithmetic & logic						
4	operations, subroutines, I/O	2	3				
	programming.	-					
	+ Quiz 1						
5	Central processor organization:	2	2	- 2 h1 J2			
	Processor bus organization.	2	3	a2,01,02			
6	Arithmetic logic unit, stack	2	2				
	organization.	2	3	a2,a3,D1			
7	 Mid-se	emester e	xam				
8	Instruction formats	2	3	a1 a2 a2 b2 d2			
		<u> </u>	3	a1,a2,a3,03,02			
9	Addressing modes.	2	3	a3,a4,b3,c2,d1			
10	Data transfer and manipulation,	2	2	o? h1 a1 d1			
	program control.	<u> </u>	3	a2,01,01,u1			

11	Micro-program control organization: Control memory. + Quiz 2	2	3	a3,a4,b3,c2,d1
12	Address sequencing.	3	2	a3,b3,c3,d2
13	Arithmetic processor design and algorithms: Comparison and subtraction of unsigned binary numbers, addition and subtraction algorithms, multiplication and division algorithms.	3	2	a4,b3,c2,d2
14	Revision	3	2	a3,a4,b3,c3,d2

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							\checkmark	\checkmark								\checkmark	\checkmark			
Self-learning																				
Assays and reviews						\checkmark		\checkmark												
Discussion groups																				

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 (Through	10	Every week	
Tutorial Exercise and Assignments)	the			
	semester			

Quiz 1	Through	5	Week#4	
	the			
	lecture			
Mid-term exam	1 hour	10	Week#7	
Quiz 2	Through	5	Week#11	
	the			
	lecture			
Practical Exam	2 hours	10	Week#14	
Final Written	2 hours	60	Week#15-16	
exam				

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:

William Stallings, "Computer Organization and Architecture Designing for Performance", Eighth Edition, 2009.

8.3. Recommended textbooks:

William Stallings, "Computer Organization and Architecture Designing for Performance", Eleventh Edition, 2019.

Shuangbao Paul Wang, "Computer Architecture and Organization, Fundamentals and Architecture Security", Higher education press, Springer.

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8.4. Journals, Periodical and Reportsetc.

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8.5. Websites

https://www.tutorialspoint.com/computer-system-architecture https://www.javatpoint.com/computer-organization-and-architecture-tutorial

Course Coordinator: Dr. Heba M. El-Hoseny Head of department: Prof. Dr. Yasser F. Ramadan Date of Approval: 24/7/2024