Sana'a University
Faculty of Engineering
Electrical Engineering Department
B.Sc. of Computer and Control Engineering

40. Course Plan of Computer Architecture and Organization

I. Information about Faculty Member Responsible for the Course							
Name of Faculty Member	Prof. Abdul Raqib Abdo Asaad	**Office Hours**					
Location & Telephone No.		**SAT**	**SUN**	**MON**	**TUE**	**WED**	**THU**
E-mail		8-10					

II. Course Identification and General Information						
1.	Course Title:	Computer Architecture and Organization				
2.	Course Number & Code:	CCE315				
3.	Credit hours:	C.H				TOTAL
		Th.	Tu.	Pr.	Tr.	
		2	2	-	-	3
4.	Study level/year at which this course is offered:	Fourth Year/ First Semester				
5.	Pre –requisite (if any):	Microprocessors & Assembly Language (CCE214)				
6.	Co –requisite (if any):	None.				
7.	Program (s) in which the course is offered	B.Sc. of Computer and Control Engineering				
8.	Language of teaching the course:	Arabic & English				
9.	System of Study:	Semesters				
10.	Mode of delivery:	Lecture				
11.	Location of teaching the course:	Class Room (Faculty of Engineering)				

Prepared by   Head of Department   Quality Assurance Unit   Dean of the Faculty   Academic Development
Asst. Prof. Dr. Adel   Assoc. Prof. Dr.   Prof. Dr. Mohammed   Center & Quality Assurance
Ahmed Al-Shakiri   Mohammad Algorafi   AL-Bukhaiti   Assoc. Prof. Dr. Huda Al-Emad

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III. Course Description

This course covers computer architecture, organization, performance, computer components, computer memory system, I/O modules, instruction sets, processor structure and function, control unit operation, and parallel organization.

This course depends on lectures and tutorials parts. In addition, it depends on Microprocessor and Assembly, and Programming Language (II) as prerequisites.

IV. Course Aims

This course aims to:

1. Understand the difference between computer organization and computer architecture.
2. Understand the concepts of computer performance and how to evaluate the performance of a digital computer.
3. Gain knowledge about computer memory system and I/O subsystems.
4. Understand the structure and function of computer processor.
5. Have knowledge of parallel organization and parallel processing.

V. Intended learning outcomes (ILOs) of the course:

1. Classify and list the different types of computer organizations and architectures.
2. Recognize the efficiency design of a digital computer and its units.
3. Compose the main units of a digital computer.
4. Evaluate the different solutions to enhance computer performance.
5. Design the main units of a digital computer according to the selected instruction set, and to meet desired performance.
6. Use simulation programs to design digital computer units.
7. Perform specific tasks individually and make a discussion group.
8. Follow the standards to achieve his reports and presentations.

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VI. Course Content:				
• Distribution of Semester Weekly Plan of Course Topics/Items and Activities				
A – Theoretical Aspect:				
Order	**Topics List**	**Sub Topics List**	**Week Due**	**Contact Hours**
1.	Introduction to Computer Architecture and Design	- Computer organization - Architecture - Function - Designing for performance - Computer component - Interconnection structure	1st, 2nd	4
2.	Computer Memory System	- Memory system (Internal Memory, External Memory) - Cache memory principle - Elements of cache design	3rd, 4th, 5th	6
3.	I/O subsystems	- Input subsystem - Output subsystem	6th, 7th	4
4.	Midterm Exam	- All previous topics	8th	2
5.	Instruction Sets	- Characteristics - Function - Addressing modes - Format	9th, 10th	4
6.	Processor Structure and Functions	- Processor organization - Register organization	11th, 12th	4
7.	Control Unit Operations	- Fetch cycle - Indirect cycle - Execute cycle - Interrupt cycle - Instruction cycle	13th, 14th	4
8.	Introduction to Parallel Organization and Processing	- Parallel organization - Parallel processing	15th	2

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9.	Final Exam	- All topics	16th	2
Number of Weeks /and Units Per Semester			**16**	**32**

B - Tutorial Aspect

Order	Topics List	Number of Weeks	Contact hours
1.	Introduction to Computer Architecture and Design (Computer organization, Architecture, Function, Designing for performance, Computer component, Interconnection structure)	2nd, 3rd	4
2.	Computer Memory System (Memory system (Internal Memory, External Memory), Cache memory principle, Elements of cache design)	4th, 5th, 6th	6
3.	Input / Output subsystems	7th, 8th	4
4.	Instruction Sets (Characteristics, Function, Addressing modes, Format)	9th, 10th	4
5.	Processor Structure and Functions (Processor organization, Register organization)	11th, 12th	4
6.	Control Unit Operations (Fetch cycle, Indirect cycle, Execute cycle, Interrupt cycle, Instruction cycle)	13th, 14th	4
7.	Introduction to Parallel Organization and Processing	15th	2
Number of Weeks /and Units Per Semester		**14**	**28**

VII. Teaching strategies of the course:

- Lectures
- Dialogue and discussion
- Lectures
- Tutorials

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- Problems solving
- Design exercises
- Self-learning

VIII. Assignments:

No.	Assignments	Aligned CILOs	Week Due	Mark
1.	Researches	a1, d1, d2	3rd	5
2.	Problems and Exercises Reports	a2, b1, b2, c1, c2, d1, d2	Weekly	5
	Total			**10**

IX. Schedule of Assessment Tasks for Students during the Semester:

No.	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment
1.	Researches	3rd	7.5	5%
2.	Problems and Exercises Reports	Weekly	7.5	5%
3.	Quizzes	4th, 6th, and 14th	15	10%
4.	Midterm Exam	8th	30	20%
5.	Final Exam	16th	90	60%
	Total		**150**	**100%**

X. Learning Resources:

1- Required Textbook(s)

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1)	W. Stalling, (2003), "Computer Organization & Architecture: Designing for Performance", Prentice Hall.
2)	M. Morris R. Mano (1992), "Computer System Architecture", Third Edition, Pearson.

2- Essential References

1) John P. Hayes (1997), "Computer Architecture and Organization", Third Edition. McGraw-Hill.

3- Electronic Materials and Web Sites *etc*.

XI. Course Policies:

1.	**Class Attendance:** The regulations are applied, which state that a student who desires more than 25% of attending lectures is deprived of the final examination.
2.	**Tardy:** If the student is late for attending the lecture time, his degree will be deducted for each delay in the attendance grades.
3.	**Exam Attendance/Punctuality:** The student must rely on himself for exam.
4.	**Assignments & Projects:** None.
5.	**Cheating:** If the student is caught cheating, he will be deprived of the exam in the subject.
6.	**Plagiarism**: In the case of student impersonation, the Vice Dean foe Student Affairs will be referred to the College's Student Affairs Committee the necessary action.
7.	**Other Policies**: If the student dose not attend more than 75% in the process, he will be deprived of the practical exam.

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