زانکۆی پۆلیتەکنیکی هەولێر
ERBIL POLYTECHNIC UNIVERSITY
EPU
1996

Kurdistan Region Government
Ministry of Higher Education
and Scientific Research
Erbil Polytechnic University

Module (Course Syllabus) Catalogue

2023-2024

College/ Institute	Erbil Technical Engineering	
Department	ISED	
Module Name	Computer Architecture	
Module Code	COA405	
Degree	Technical Diploma ☐ Bachler ☑ High Diploma ☐ Master ☐ PhD ☐	
Semester	fourth	
Qualification		
Scientific Title	Ass.Prof	
ECTS (Credits)	6	
Module type	Prerequisite ☐ Core ☑ Assist. ☐	
Weekly hours	4	
Weekly hours (Theory)	(2)hr Class	(2)Total hrs workload
Weekly hours (Practical)	(2)hr Class	(2)Total hrs Workload
Number of Weeks	15	
Lecturer (Theory)	Ass.Prof.Dr. Bzar Khidir hussan	
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Lecturer (Practical)	Ms. Kurdistan	
E-Mail & Mobile NO.		
Websites	Epu.edu.iq	

Course Book

Course Description	**Course overview:** Computer architecture is concerned with the structure and behaviours of the various functional modules of the computer; and how they interact to provide the processing needs of the user. In particular, this course covers computer systems ranging from PCs through multiprocessors with respect to hardware design and instruction set architecture. This includes units and related technologies such as primary and secondary memory, caches, central processing units (CPU), and pipelines. A menu of "possibilities" will be presented, analysed, and evaluated based on the technology available today. In no event should it be assumed that the architecture that looks the strongest today will be the best in the new millennium.
Course objectives	1. Relation between hardware design and instruction set architecture. 2. Learn assembly language programming. 3. Identify computers' major components and study their functions. 4. Introduce hardware design issues of modern computer architectures. 5. Build the required skills to read and research the current literature in computer architecture. Evolution and development of computers.
Student's obligation	Student's obligation in the Computer architecture course is: I expect the student to come to class, study the materials and textbook and do the homework, activities and exams. It is the student's responsibility to check what we covered in class and the announcements during class if he or she did not attend. The best way of learning Computer Architecture is by practicing it. You can acquire a good knowledge level by doing all examples from the textbook. The course is very time demanding. Plan ahead all your activities and if you have any problem with your homework or your study, do not hesitate to ask questions to the Instructor. You are encouraged to discuss problems with others and to work them out on the whiteboard, but when you sit down to write or code up your solution you must work on your own, without any further interaction. You are not allowed to share your solutions (literal code and theory solutions) with other students.
Required Learning Materials	1. White board 2. Projector.

Evaluation

Task		Weight (Marks)	Due Week	Relevant Learning Outcome
Paper Review				
Assignments	Homework	7		
	Class Activity			
	Report	10		
	Seminar			

		Essay			
		Project	10		
	Quiz		8		
	Lab.				
	Midterm Exam		25		
	Final Exam		40		
	Total		100		

Specific learning outcome:	The course will give the fundamental knowledge and practical abilities in the following: • Relation between hardware design and instruction set architecture. • Learn assembly language programming. • Identify computers' major components and study their functions. • Introduce hardware design issues of modern computer architectures. • Build the required skills to read and research the current literature in computer architecture. • Evolution and development of computers
Course References:	• Computer Architecture, A.P.Godse, D.A.Godse • "Computer Organization," by Carl Hamacher, Zvonko Vranesic and Safwat Zaky. Fifth Edition • Computer Organization and Architecture by "William Stallings" • The 80x86 IBM PC and Compatible Computers by Muhammad Ali Mazidi and Janice Gillispie Mazidi. Computer Architecture a Quantitative Approach, by Hensly and Patterson (5th Edition)

Course topics (Theory)	Week	Learning Outcome
Introduction to Computer Architecture	1	
Why Study Computer Organization & Architecture? Computer Architecture versus Organization. Computer Types.	2	
The Von-Neumann MODDEL, Functional Units, Input Unit Memory. Arithmetic and Logic Unit(ALU)), Control and Output Unit.	3-4	
Basic Operational Concept, Bus Introduction, Data Bus, Address Bus, Control Bus, Single Bus Structure, Multiple Bus Structure,	5-6	
Introduction CPU Introduction, Characteristic Study, Process Study, 8086 Microprocessor Study in detail. Multiprocessor	7-8	
Memory System Chapter: Cache Memory, Internal Memory, External Memory	9	

	Week	Learning Outcome
I/O Units, External Devices, Interfaces.	10	
Instruction Queue and Pipelining	11	
Parallel processing	12	

Practical Topics	Week	Learning Outcome
Introduction to 8086 Microprocessor	1	
Operand types, Necessary Notes	2-3	
Data Movement Introduction	4	
Arithmetic Instructions	5	
Logical Instructions	6	
String Primitive Instruction	7-8	
I/O Instructions	9-10	
Interrupt Instructions	11	
Rotate & Shift Instructions	12	

Questions Example Design;

Q/ define: Cache Memory, Arithmetic and Logic unit

Q / What are segment registers and their uses?

Q/ Draw Internal Architecture of Intel 8086 Microprocessor?

Q Multiple choices:

1. A 32-bit microprocessor has a word length equal to :

   a) 8 byte   b) 2 byte   c) 4 byte

2. A group of bits that tell the computer to perform a specific operation is known as

   (A) Instruction code. (B) Micro-operation. (C) Accumulator. (D)Register.

Extra notes:

External Evaluator

Shahab Wahhab Kareem

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