



Department of ... Computer

College of Science

University ofCihan.....

Subject: Computer Architecture

Course Book – Year 3 (Semester 1)

Lecturer's name Dr. Kusay Faisal Abdulrazak

Academic Year: 2023/2024

Course Book

1. Course name	Computer Architecture
2. Lecturer in charge	Dr. Kusay Faisal Abdulrazak
3. Department/ College	Computer Science
4. Contact	e-mail: Kusay.faisal@sulicihan.edu.krd Tel:
5. Time (in hours) per week	Theory: 3 hours Practical: -----
6. Office hours	2hr/ week
7. Course code	CSC 3105
8. Teacher's academic profile	<p>Dr. Kusay Faisal was born in Sheffield, UK, 1977. Received B.SC in electrical and electronics engineering in year 2000. Received M.Sc. and Ph.D. degrees in telecommunication engineering from University Technology Malaysia (UTM) in 2007 and 2013 respectively.</p> <p>He did researches in Wireless communication, Radar, Satellite, LMDS, HAPS, broadband wireless access, and wireless networking fields. Worked as assistant professor doctor in the faculty of computer science at Cihan University, Sulaimanya, taught the following subjects:</p> <ul style="list-style-type: none"> · Microprocessor structure · Computer Architecture. · MATLAB Programming · Multimedia. · Image processing. · Operation research · English for computer · Computer application · Account software package · Accounting Information System · Computer Skills
9. Keywords	Instruction Set Architecture (ISA), Arithmetic Logic Unit (ALU), Pipelining, hit time, miss time, RAM, ROM, Microprocessor without Interlocked Pipeline Stages (MISP), Reduced Instruction Set Computer (RISC), and mapping.
10. Course overview:	
<p>In this course the student will be exposed to fundamental issues of the architecture of modern computers. The main objective is to provide students with the knowledge necessary to understand the functional logic of the main components of modern computers. Topics include the logical design, the different types of memory (RAM, ROM). Principles (ROM, SRAM, DRAM), Hard disk. Address (physical, logical). Cache memory .. and its</p>	

organization, registers, the CPU and its organization (main function, structure of CPU. Pipelining of instructions), construction and operation of buses, I/O devices and their interfaces. Different levels of abstraction of the computer architecture will be studied.

11. Course objective:

The students will gain:

1. Describe and understand the characteristics of computer architectures and digital logic layer.
2. Analyze and enhance the computation power by evaluating the processor performance.
3. Understand the bus structures existing in computer architectures and the layered memory system including cache and main memory.

12. Student's obligation

The student should attend lectures and completion of all tests, exams, assignments, reports , essays...etc

13. Forms of teaching

The English language will be used in conducting the class. The computer and data show will be used for lectures slides presentation, whiteboard and marker will be used for further explanation.

There will be discussions, homework and quizzes throughout the semester, lecturer will give enough time to analyze, evaluate, and solve problems.

14. Assessment scheme

The 100 mark will be divided as shown in the table below:

Mid-semester exam	30 %
Homework's, quizzes	10 %
Final exam	60 %

15. Student learning outcome:

The students will be able to recognize and interpret the following:

1. Evaluate system hardware and resources, for installation and configuration purposes.
2. Define Computer Organization and Architecture.
3. Discuss the organization and architecture of computer systems as it applies to the design of computational machines.
4. Logically compare and choose the best performance concepts and techniques used in the design of computer CPU's, memory hierarchies and bus systems.

5. Discuss how to evaluate and improve the performance of a computer by changing its organization and architecture.
6. Evaluate different implementations and overall design techniques of computer systems.

16. Course Reading List and References:

1. María J. Garzarán, CS231: Computer Architecture I, Spring 2008.
2. Mahadevan Gomathisankaran, Computer Systems Architecture, lectures, April 27, 2010.
3. ECE4680, Computer Organization and Architecture, lectures, wayne state university, 2002.
4. Stallings, William. Computer Organization and Architecture. 9th ed., Upper Saddle River, NJ: Pearson/ Prentice Hall, 2012.

18. Practical Topics (If there is any)

Week	Topic	Lecturer
1	Introduction, course outline	Dr. Kusay Faisal
2	Computer evaluation and performance	
3	Definitions of digital system, computer hardware CPU, ALU	
4	Design as representation	
5	Functional specification of the ALU	
6	A 4 bit adder	
7	Logic detection circuit (subtraction, overflow,	
8	zero, carry, compare)	
9	Driving ALU requirements	
10	Multiply hardware	
11	Divide hardware	
12	Pipelining	
13	Memory hierarchy	
14	Cache memory mapping	
15	Suggestions to improve speed and solve problems	

19. Examinations:

The type of exam comes about all the studied topics like how to improve chip organization and architecture, processor performance, logic detection circuit,etc.

20. Extra notes:

None

21. Peer review

Lecturer



Dr. Kusay Faisal Abdulrazak

Reviewed and signed by:

Coordinator lecturer:

Dr. Lway Faisal Abdulrazak

Head of Department: