



Jordan University of Science and Technology
Faculty of Computer & Information Technology
Computer Engineering Department

CPE352 Computer Architecture - JNQF Level: 7

Second Semester 2023-2024

Course Catalog

3 Credit Hours. Processor design, RISC and CISC; floating-point unit; memory management; caches; I/O systems; DMA; CPU utilization and performance measures. - Pre-requisite: CPE252 (Computer Organization and Design) - Pre-requisite for: CPE470 (Operating Systems), CPE433 (Advanced Digital Systems Design) - Core Course for: CpE and NES students

Teaching Method: Blended

Text Book

Title	Computer Organization and Design
Author(s)	David Patterson and John Hennessy
Edition	5th Edition
Short Name	Textbook
Other Information	

Instructor

Name	Prof. Ali Shatnawi
Office Location	M2L2
Office Hours	Sun : 12:30 - 13:30 Mon : 09:00 - 10:00 Mon : 11:30 - 13:15 Wed : 09:00 - 10:00 Wed : 11:30 - 12:30 Thu : 08:00 - 08:15
Email	ali@just.edu.jo

Instructor

Name	Dr. Mazen AlWadi
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Office Location	M2 L2
Office Hours	Sun : 09:30 - 11:00 Mon : 11:30 - 13:00 Tue : 09:30 - 11:00 Wed : 10:00 - 11:30
Email	mgalwadi@just.edu.jo

Class Schedule & Room
<p>Section 1: Lecture Time: Mon : 10:00 - 11:30 Room: C2007</p> <p>Section 2: Lecture Time: Wed : 10:00 - 11:30 Room: C2007</p> <p>Section 3: Lecture Time: Sun, Tue : 08:30 - 09:30 Room: C2007</p>

Prerequisites		
Line Number	Course Name	Prerequisite Type
1712520	CPE252 Computer Organization And Design	Prerequisite / Pass

Tentative List of Topics Covered		
Weeks	Topic	References
Week 1	Assessing and Understanding Performance	
Weeks 2, 3	The MIPS Instruction Set Architecture (ISA)	
Weeks 4, 5	Arithmetic for Computers	
Weeks 6, 7	The Processor: Datapath and Control	
Weeks 8, 9, 10	Pipelining	
Weeks 11, 12, 13	Caches and the Memory Hierarchy	
Weeks 14, 15	Instruction Level Parallelism	

Mapping of Course Outcomes to Program Outcomes and NQF Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Understand how a CPU's performance is assessed and evaluated. [1SO1] [1L7K1]	15%	First Exam

Have a detailed understanding of the MIPS instruction set and be able to use it to write assembly programs. [1SO1] [1L7K1]	15%	First Exam, Second Exam, Quizzes
Have a basic understanding of a processor's arithmetic hardware and its operation. [1SO2] [1L7S1]	10%	Second Exam, Quizzes
Realize the advantages of Instruction-Level Parallelism (ILP). [1SO2] [1L7S2]	5%	Second Exam
Have a detailed understanding of pipelining. [1SO2] [1L7S1]	15%	Final, Second Exam
Explain different techniques used to resolve data hazards including stalling, forwarding (bypassing), and code rescheduling. [1SO2] [1L7S1]	10%	Final, Quizzes
Explain different techniques used to resolve and reduce the cost of control hazards including stalling, branch prediction, delayed branches, and loop unrolling. [1SO2] [1L7S1]	10%	Final, Quizzes
Understand the different cache organizations (direct-mapped, fully-associative, and set-associative) and write-policies (write-back and write-through). [1SO2] [1L7S1]	10%	Final
Have a basic understanding of the concept of virtual memory and the roles of the page table and TLB. [1SO2] [1L7S1]	10%	Final

Relationship to Program Student Outcomes (Out of 100%)

A	B	C	D	E	F	G	H	I	J	K	SO1	SO2	SO3	SO4	SO5	SO6	SO7
											30	70					

Relationship to NQF Outcomes (Out of 100%)

L7K1	L7S1	L7S2
30	65	5

Evaluation

Assessment Tool	Weight
First Exam	20%
Final	40%
Second Exam	20%
Quizzes	20%

Policy

Attendance	Excellent attendance is expected. In accordance with university regulations, students missing more than 20% of total classes are subject to failure. No excuses will be accepted. If you miss class, it is your responsibility to find out about any announcements or assignments you may have missed. Attendance will be recorded at the beginning or end of each class.
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Participation	You are expected to participate in class. Participation includes asking and answering questions, raising issues, and suggesting solutions to the discussed problems.
Activity	TBD.
Exams	All exams will be CLOSE-BOOK. The format for the exams is generally as follows: multiple-choice, and short essay questions.
Makeups	Makeup exam should not be given unless there is a valid excuse. Arrangements to take an exam at a time different than the one scheduled MUST be made prior to the scheduled exam time. In accordance with university regulations, students should bring a valid excuse authenticated through valid channels in JUST.
Workload	Average work-load student should expect to spend is 6 hours/week.
Code of Conduct	Quizzes and exams need to be done individually. Copying of another student's work, even if changes are subsequently made, is inappropriate, and such work will not be accepted. Cheating or copying from neighbor on exam is an illegal and unethical activity and standard JUST policy will be applied. All graded assignments must be your own work.

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