East West University
Department of Computer Science and Engineering
Course Outline of CSE360/ICE469
Spring 2025 Semester

Course Information

Course: CSE360/ICE469 Computer Architecture

Credit and Teaching Scheme:

	Theory	Laboratory	Total
Credits	3	-	3
Contact Hours	2.5 Hours/Week for 16 Weeks	-	2.5 Hours/Week for 16 Weeks

Prerequisite: CSE325 Operating Systems, CSE345 Digital Logic Design

Instructor Information

Instructor: **Md. Ezharul Islam, PhD**
Professor, Department of Computer Science and Engineering
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Class code:

Course Objective

The objective of this course is to study the structure, behavior, and characteristics of computer systems. This course will exhibit the design of the various functional units of digital computers, discuss different types of memories and their properties, and introduce basics of parallel computer architecture. Knowledge of this course will be needed as prerequisite knowledge for future course, such as CSE442 Microprocessors and Microcontrollers.

Course Outcomes (COs)

After completion of this course students will be able to:

CO1	**Understand** the structure, function, and characteristics of digital computers.
CO2	**Understand**, **determine** and **analyze** performance of memory and I/O subsystems.
CO3	**Understand**, **implement**, **examine**, and **justify** instruction set design for performance improvement, **execute** and **demonstrate** this knowledge, and **write** report for problem solving.
CO4	**Implement**, **examine**, and **justify** processor and control unit design, **execute** and **demonstrate** this knowledge, and **write** report to synthesize functional units of digital computers.

Mapping of Course Outcomes (COs) to Program Outcomes (POs)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	X											
CO2	X	X										
CO3	X	X	X						X	X		X
CO4	X	X	X						X	X		X

Complex Engineering Problems and Activities

Attributes of Complex Engineering Problems Involved

CO	PO	Attributes
CO1	PO1	Range of conflicting requirements
CO2	PO1, PO2	Range of conflicting requirements
CO3	PO1, PO2, PO3	Range of conflicting requirements, depth of analysis required
CO4	PO1, PO2, PO3	Range of conflicting requirements, depth of analysis required

Attributes of Complex Engineering Activities Involved

CO	PO	Attributes
CO3 (Assignment)	PO10	Range of resources, Level of interaction, Familiarity
CO4 (Assignment)	PO10	Range of resources, Level of interaction, Familiarity

Course Topics, Teaching-Learning Methods and Assessment Scheme

Mid Exam:

Course Topic	Teaching-Learning Method	CO	Mark of Cognitive Learning Levels			Mark of psychomotor Learning Levels		CO Mark
			C2	C3	C4	P	P2	
Computer Evolution: Function and structure of a computer, Functional components of a computer, Interconnection of components, Performance analysis of a computer, Hardware architecture	Lecture, Class Discussion, Discussion Outside Class with Instructor/ Teaching Assistant	CO1	4	4				8
Representation of Instructions: Bus Interconnection, Scalar Data Types, Fixed and Floating-point CO1 12 5 17 Page 4 of 8 numbers,		CO1		12	5			17

Signed numbers, Integer Arithmetic, 2's Complement method for multiplication, Booths Algorithm, Floating point representations, IEEE standards, Floating point arithmetic								

Mid Exam:

Memory Organization Characteristics of memory systems, Internal and External Memory, Types of memories: ROM: PROM, EPROM, EEPROM, RAM: SRAM, DRAM, SDRAM, RDRAM, HighSpeed Memories: Cache Memory, elements of cache design, Pentium 4 cache, Organization and Mapping Techniques, Replacement Algorithms, Cache Coherence, Secondary Storage: Magnetic Disk, Tape, DAT, RAID, Optical memory, CDROM, DVD, Error correction memories, Interleaved memories, Hardware support of memory management	Do	CO2	4	4	8			16
Input/Output Organization: External Devices, I/O modules, Programmed I/O, Interruptdriven I/O, Direct memory access, I/O channels and processors,	Do	CO2			9			9

external interface								
Instruction Sets: Machine instruction, operands, operations, and assembly language, addressing, and instruction format	Do	CO3		6	4			10
CPU structure and function: processor and registers organization, instruction cycle and instruction pipelining, Reduced Instruction Set Computers (RISC), superscalar processors, parallel processing, Micro programmed control unit	Do	CO4		5	10			15

Mini Project/Assignment/Presentation

Course Topic	Teaching-Learning Method	CO	Mark of Cognitive Learning Levels			Mark of psychomotor Learning Levels		CO Mark	Exam (Mark)
			C2	C3	C4	P1	P2		
Mini Project	Team-based moderately complex project with report writing and oral presentation	CO3, CO4	1 1	1 1	1 1	1 1	1 1	5 5	Assignment (10)

Overall Assessment Scheme

	CO				Assessment Area Mark
Assessment Area	**CO1**	**CO2**	**CO3**	**CO4**	
Class Test/Quizzes	2.5	2.5	2.5	2.5	10
Midterm Exam – I	15.0	10.0	5.0		30
Final Exam		10.0	15.0	15.0	40
Mini Project				10.0	10
Assignment/Presentation		5.0	5.0		10
Total Mark					**100**

Teaching Materials/Equipment

Text Book:

[1] William Stallings Computer Organization and Architecture, Seventh Edition, Prentice Hall Upper Saddle River
[2] David A. Patterson, John L. Hennessy - Computer Organization and Design - Elsevier

Project/Assignment/Presentation:
Mini Project will be provided

Grading System

Marks (%)	Letter Grade	Grade Point	Marks (%)	Letter Grade	Grade Point
80-100	A+	4.00	50-54	C+	2.50
75-89	A	3.75	45-49	C	2.25
70-74	A-	3.50	40-45	D	2.00
65-69	B+	3.25	0-39	F	0.00
60-64	B	3.00			
55-59	B-	2.75			

Exam Dates

Section	Term I	Final
*	*	05.06.2024 (Wed)

Academic Code of Conduct

Academic Integrity:
Any form of cheating, plagiarism, personification, falsification of a document as well as any other form of dishonest behavior related to obtaining academic gain or the avoidance of evaluative exercises committed by a student is an academic offence under the Academic Code of Conduct and **may lead to severe penalties as decided by the Disciplinary Committee of the university.**

Special Instructions:

- Students are expected to attend all classes and examinations. A student MUST have at least 80% class attendance to sit for the final exam.
- Students will not be allowed to enter into the classroom after 10 minutes of the starting time.
- For plagiarism, the grade will automatically become zero for that exam/assignment.
- Normally there will be **NO make-up exam**. However, in case of **severe illness, death of any family member, any family emergency, or any humanitarian ground**, if a student miss any exam, the student MUST get approval of makeup exam by written application to the Chairperson through the Course Instructor **within 48 hours** of the exam time. Proper supporting documents in favor of the reason of missing the exam have to be presented with the application.

- For **final exam**, there will be NO makeup exam. However, in case of **severe illness, death of any family member, any family emergency, or any humanitarian ground**, if a student miss the final exam, the student MUST get approval of **Incomplete Grade** by written application to the Chairperson through the Course Instructor **within 48 hours** of the final exam time. Proper supporting documents in favor of the reason of missing the final exam have to be presented with the application. **It is the responsibility of the student to arrange an Incomplete Exam within the deadline mentioned in the Academic Calendar in consultation with the Course Instructor**.
- All mobile phones MUST be turned to silent mode during class and exam period.
- There is **zero tolerance for cheating** in exam. Students caught with cheat sheets in their possession, whether used or not; writing on the palm of hand, back of calculators, chairs or nearby walls; copying from cheat sheets or other cheat sources; copying from other examinee, etc. would be treated as cheating in the exam hall. The only penalty for cheating is **expulsion for several semesters as decided by the Disciplinary Committee of the university**.