

COMPUTER ORGANIZATION AND ARCHITECTURE (COA)

EET-2211

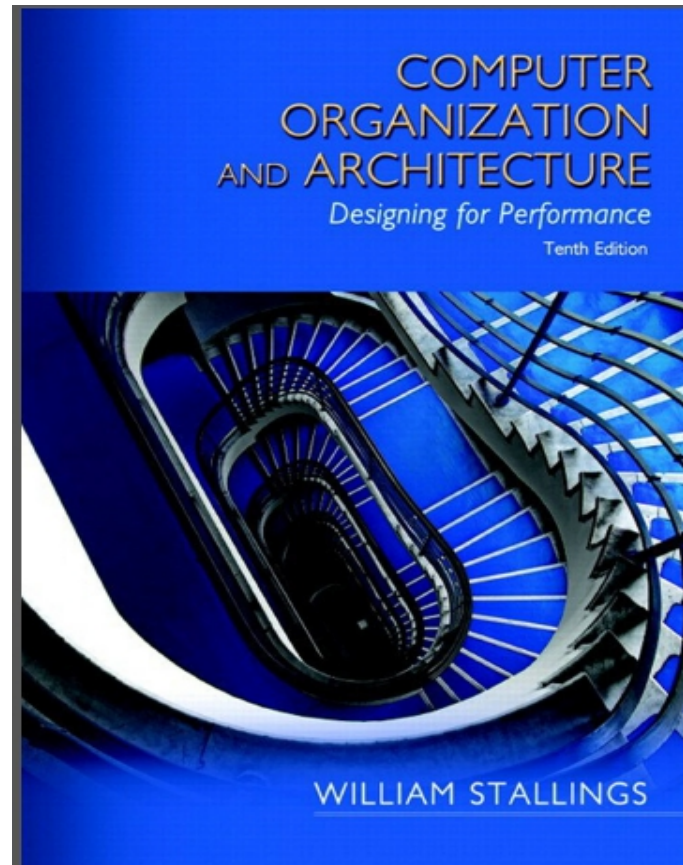
EET 2211
4TH SEMESTER – CSE & CSIT
LECTURE 0

EVALUATION SCHEME

INTERNAL COMPONENT	MARKS	EXTERNAL COMPONENT	MARKS
Mid-semester examination	15	End-semester examination	45
Assignments	10	External project	15
Quiz / Viva	10		
Attendance	05		
Total	40		60

TEXT BOOKS

Computer Organization and Architecture by William Stallings, Pearson publication, 10TH Edition.



COURSE FORMAT

- 3 Classes / Week : 1 Hr / Class
- 1 Lab / Week : 2 Hrs / Lab
- 4 Credits
- Pre-requisite : EET-1211 (Digital Logic)

TOPICS TO BE COVERED

PART 1 INTRODUCTION

- Basic concepts and Computer Evolution
- Performance Issues

PART 2 THE COMPUTER SYSTEM

- A top level view of Computer Function and Interconnection
- Cache Memory
- Internal Memory
- External Memory
- Input / Output
- Operating System Support

PART 3 ARITHMETIC AND LOGIC

- Number Systems
- Computer Arithmetic
- Digital Logic

Contd.

PART 4 THE CENTRAL PROCESSING UNIT

- Instruction Sets : Characteristics and Functions
- Instruction Sets : Addressing Modes and Formats
- Processor Structure and Function
- Reduced Instruction Set Computers
- Instruction-Level Parallelism and Superscalar Processors

PART 5 PARALLEL ORGANIZATION

- Parallel Processing
- Multicore Computers
- General purpose Graphic Processing Units

PART 6 THE CONTROL UNIT

- Control Unit Operation
- Micro-programmed Control

LESSON PLAN

Lect. No.	Topics Covered	References
L1-L4	Basic Concepts and Computer Evolution	Chapter 1
Lect. 1.	Organization and Architecture Structure and Function	1.1 1.2
Lect. 2.	A Brief History of Computers	1.3
Lect. 3.	The Evolution of the Intel x86 Architecture Embedded Systems ARM Architecture	1.4 1.5 1.6
Lect. 4.	Cloud Computing	1.7
L5-L8	Performance Issue	Chapter 2
Lect. 5.	Designing for Performance Multicore, MICs, and GPGPUs Two Laws that Provide Insight: Amdahl's Law and Little's Law	2.1 2.2 2.3
Lect. 6.	Basic Measures of Computer Performance	2.4
Lect. 7. Lect. 8.	Calculating the Mean Problem Solving	2.5
L9-L14	A Top-Level View of Computer Function and Interconnection	Chapter 3
Lect. 9	Computer Components Computer Function	3.1 3.2
Lect. 10.	Computer Function	3.2
Lect. 11.	Interconnection Structures Bus Interconnection	3.3 3.4
Lect. 12.	Point-to-Point Interconnect	3.5
Lect. 13.- 14	PCI Express	3.6

Contd.

L15-L19	Cache Memory	Chapter 4
Lect. 15.	Computer Memory System Overview	4.1
Lect. 16.	Cache Memory Principles	4.2
Lect. 17.-19	Elements of Cache Design	4.3
L20-L21	Internal Memory	Chapter 5
	Semiconductor Main Memory	5.1 assignment
Lect. 20.-21	Error Correction	5.2
	Newer Nonvolatile Solid-State Memory Technologies	5.3 5.4,5.5 assignment
L22-L25	External Memory	Chapter 6
Lect.22-23	RAID	6.2
Lect.24-25	Optical Memory	6.4
	Magnetic Disk , Solid State Drives, Magnetic Tape	assignment
L26-L28	Input/Output	Chapter 7
Lect. 26	External Devices I/O Modules Programmed I/O	7.1 7.2 7.3
Lect. 27	Direct Memory Access	7.5
Lect. 28	Direct Cache Access	7.6
L29-L30	Operating System Support	Chapter 8

Contd.

Lect.29	Operating System Overview Scheduling	8.1 8.2
Lect.30	Memory Management	8.3
L31-L32	Reduced Instruction Set Computers	Chapter 15
Lect.31	Instruction Execution Characteristics The Use of a Large Register File Compiler-Based Register Optimization	15.1 15.2 15.3
Lect.32	RISC Pipelining	15.5
	Reduced Instruction Set Architecture, MIPS R4000 ,SPARC ,RISC versus CISC Controversy	15.4,15.6,15.7,15.8 (lab)
L33-L35	Parallel Processing	Chapter 17
Lect.33	Multiple Processor Organizations 6 Symmetric Multiprocessors	17.1 17.2
Lect.34	Cache Coherence and the MESI Protocol Multithreading and Chip Multiprocessors	17.3 17.4
Lect.35	Clusters Non-uniform Memory Access	17.5 17.6
L36-L37	Multicore Computers	Chapter 18
Lect.36	Hardware Performance Issues Software Performance Issues	18.1 18.2
Lect.37	Multicore Organization Heterogeneous Multicore Organization	18.3 18.4
L38-L39	ARITHMETIC AND LOGIC	Chapter 9-11
L40	Overview of 8086 Microprocessor and ARM Processor	Chapter 12-14