

Uka Tarsadia University



B. Tech.

**Computer Organization and Architecture
(030090403)**

4th Semester

EFFECTIVE FROM January-2013

Uka Tarsadia University

A. Prerequisite: Basics of Digital Logic Design, Fundamentals of programming

B. Aim and Objective: To provide a comprehensive knowledge of overall basic computer hardware structure, including the peripheral devices.

C. Subject Code: 030090403

Subject: Computer Organization & Architecture

D. Total: 60 Hrs.

[Lecture: 4

Tutorial: 0

Practical: 0]

E. Detailed Syllabus:

Sr. No.	Topic Name	Weightage (%)
1.	Overview Of Register Transfer And Micro-operations	15
1.1	Register Transfer, Register transfer Language	
1.2	Bus and Memory transfer Unit	
1.3	Arithmetic Micro-operations, Logic Micro-operations	
1.4	Shift Micro-operations, Arithmetic Logic Shift Unit	
2.	Basic Computer Organization and Design	20
2.1	Instruction codes, Computer registers, computer instructions	
2.2	Timing and Control, Instruction cycle	
2.3	Memory-Reference Instructions	
2.4	Input-output and interrupt, Complete computer description	
2.5	Design of Basic computer	
2.6	Design of Accumulator Unit	
3.	Programming The Basic Computer	15
3.1	Introduction	
3.2	Machine Language, Assembly Language	
3.3	The Assembler, Program loops	
3.4	Programming Arithmetic and logic operations, subroutines, I-O Programming	

4.	Micro-programmed Control	10
4.1	Control Memory, Address sequencing	
4.2	Micro-program Example	
4.3	Design of control Unit	
4.4	Central Processing Unit: Introduction, General Register Organization, Stack Organization	
4.5	Instruction format, Addressing Modes, data transfer and manipulation	
4.6	Program Control, Reduced Instruction Set Computer (RISC)	
5.	Pipeline And Vector Processing	20
5.1	Parallel Processing	
5.2	Pipelining	
5.3	Pipeline: Arithmetic Pipeline, Instruction Pipeline, RISC Pipeline	
5.4	Vector Processing	
5.5	Array Processors	
6.	Computer Arithmetic	20
6.1	Introduction, Addition and subtraction, Multiplication and	
6.2	Division Algorithms	
6.3	Floating Point Arithmetic	

F. Modes of Transaction (i.e. Delivery)

1. Lectures /discussion method shall be fruitful. It should be supplemented with various appropriate audio-visual aids.
2. Assignments based on course content shall be given to the students. It should be evaluated at regular intervals.
3. Surprise tests/Quizzes/Seminar/Tutorials shall be conducted.
4. At the start of course, discuss the course delivery pattern and prerequisite of the subject.

G. Teachers Activities/Practicum

The following activities should be carried out by the teachers:

1. Demonstration of the internal hardware parts of Computer will be done.
2. Comparison of various Processer models.
3. Demonstrate the working of computer by various models/videos.
4. Give the example of Intel 8086 basic CPU organization.

H. Student Activities/Practicum

The following activities may be carried out by the students:

1. Study of trends in computer.
2. Study the evolution in processor development.
3. Detail study of computer architecture and its organization.

I. Text Books

1. Computer System Architecture: By M. Morris Mano
2. Hall Douglass V, Microprocessor Interfacing & programming, Tata McGraw-Hill
3. Student can refer Reference book or can use any Content available on Internet

J. Reference Books

1. Structured Computer Organization: By Tanenbaum
2. Computer Organization: By Stallings
3. Computer Architecture and Organization: By Hayes