COURSE NAME : COMPUTER ENGINEERING

COURSE CODE : CO/CD

SEMESTER : FIFTH FOR CO AND SIXTH FOR CD

SUBJECT TITLE : ADVANCED MICROPROCESSOR (ELECTIVE-I)

SUBJECT CODE : 9119

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme						
TH	TU	PR	PAPER HRS	TH	TEST	PR	OR	TW	TOTAL
02	--	04	03	80	20	--	--	25@	125

Rationale:

Advanced microprocessors are the requirement of current market. The 8086 has certain limitations, so the microprocessor Intel 80286 was introduced with memory management, privilege & protection. The Intel 80386, 80486, Pentium are the advanced microprocessors which support multitasking, with high speed execution, enhanced instruction set, five stage pipelining architecture & incorporating parallelism. The importance of microprocessor based system design cannot be underestimated in today's world, as they are extensively used in industrial area.

This subject covers the fundamental concepts of advanced microprocessors and their architectures.

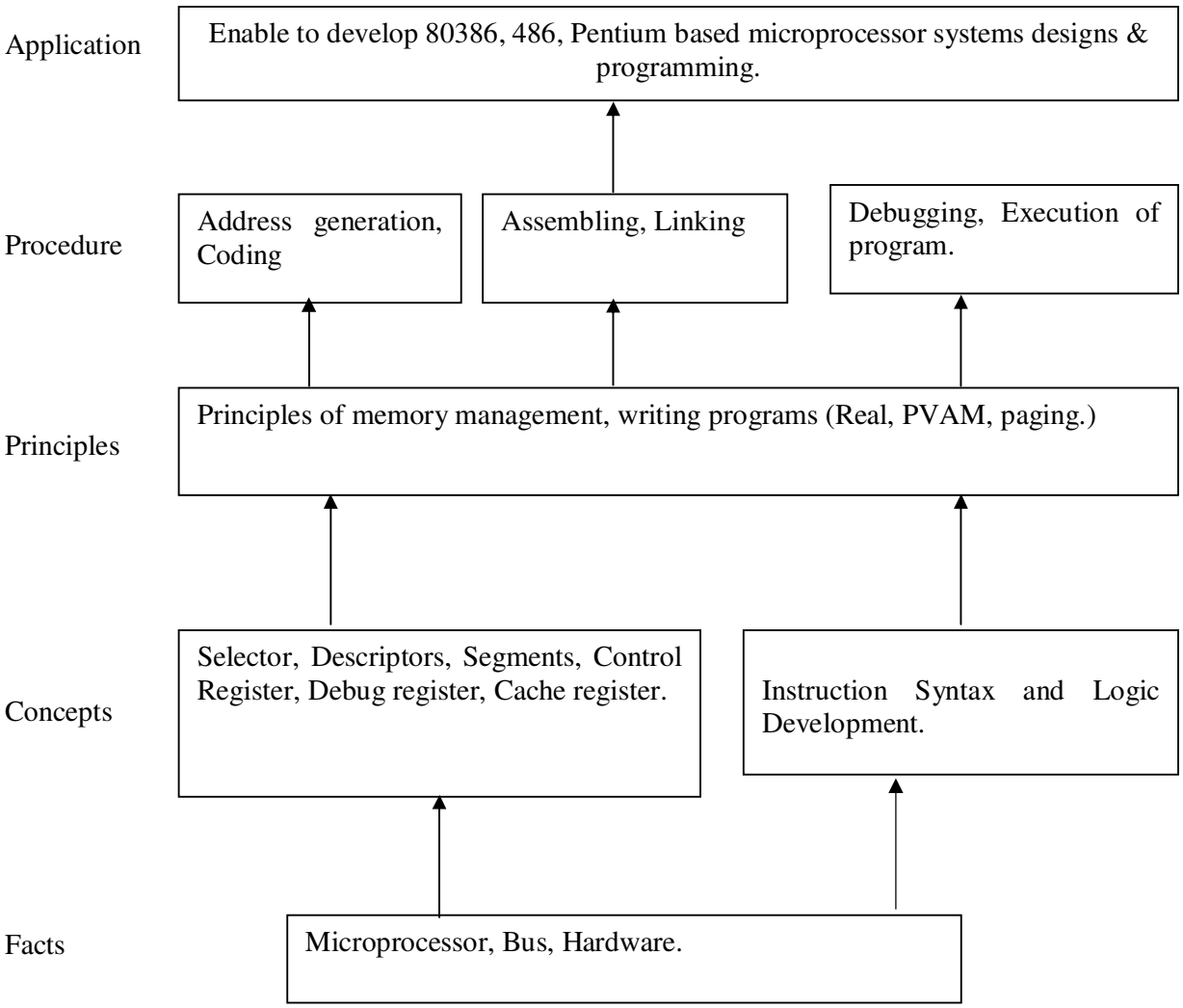
This will enable students to write efficient programs in assembly language. It covers the interesting programming & application part of microprocessors.

Objectives:

Students will be able to:

1. Explain architecture and memory management of 80286.
2. Explain concepts of multitasking
3. Know architecture and memory management of 80386.
4. State the concept of paging
5. Describe features and architecture of 80486, Pentium.
6. Programming in assembly using different functions of DOS & BIOS interrupts.

Learning Structure:



Contents: Theory

Chapter	Name of the Topic	Hours	Marks
01	**16-bit Microprocessor - Intel 80286.** 1.1 Salient features, Internal architecture, Register organization (General purpose register, segment register, status and control register, instruction pointer, segment descriptor cache register) 1.2 Addressing mode such as Real, Protected Virtual Addressing mode, Selector, Descriptors and its types, LDT, GDT, IDT, privilege protections. Operations of 80286 in Real and PVAM.	**10**	**24**
02	**32-bit Microprocessor –Intel 80386.** 2.1 Salient features, internal architecture, Register organization (General-purpose register, segment register, status and control register, instruction pointer. Segment descriptor cache register. System address register LDTR & GDTR, TR, Debug register, Test registers, Control register. 2.2 Addressing modes of 80386, real, PVAM, paging, virtual 8086. Address translation in real, PVAM, paging, Enabling and disabling paging (Machine Status word)	**10**	**24**
03	**Interrupts of X86 microprocessor:** 3.1 Introduction to X86 interrupts (Hardware, software and exceptions), Interrupt vector table, Interrupt processing sequence. Hardware or exception interrupts (Singles step, divide by zero/overflow, non-maskable, breakpoint, overflow) software interrupts (INT, INTO instructions) 3.2 Introduction to MS-DOS, The structure of MS-DOS (BIOS Module, DOS kernel, command processor), Loading of MS-DOS introduction to *.com* and *.exe* programs, DOS & BIOS Interface, Interrupt Services, DOS& BIOS Interrupts.	**08**	**20**
04	**Advanced Microprocessors (Intel 486 & Pentium)** 4.1 Salient features of 486. Salient features of Pentium System architecture (Super-scalar Execution, Separate code & data cache, Floating Point Exceptions, Branch prediction.	**04**	**12**
	Total	**32**	**80**

Practical:
Skills to be developed:

Intellectual skills:

- Use of programming language constructs in program implementation
- To be able to apply different logics to solve given problem.
- To be able to write program using different implementations for the same problem
- Study different types of errors as syntax semantic, fatal, linker & logical
- Debugging of programs

- Understanding different steps to develop program such as
    - Problem definition.
    - Analysis.
    - Design of logic
    - Coding.
    - Testing.
    - Maintenance (Modifications, Error corrections, Making changes etc.)

Motor skills:

- Proper handling of Computer System**.**

List of Practical:

1) Write an assignment on keyboard and display function 01H.,02H,08H,09H,0AH of DOS INT 21H and program to read password & validate the user.

2) Write an assignment on keyboard functions 02H of BIOS INT 16H (Get Keyboard Flags) and program to display the status of keys described in 02H functions of BIOS INT 16H.

3) Write an assignment on screen functions 06H (Scroll screen up), 07H (Scroll screen down) of BIOS INT 10H and program to simulate CLS (Clear Screen) command.

4) Write an assignment on ASCIIZ string, file handle, file functions 41H (delete file), 56H (Rename file) of DOS INT 21H and program to simulate DEL (Delete file) and REN (Rename file) command.

5) Write an assignment on file functions 43H (Set/Get file attribute) and 57H (Set/Get file time & date) of DOS INT 21H and program to display the attribute and date/ time of any file.

6) Write an assignment on directory functions 39H (Create directory), 3AH (Delete directory) of DOS INT 21H and program to simulate MD (Make directory), RD (Remove Directory) commands.

7) Write an assignment on directory functions 3BH (Change Directory), 47H(Get current directory) of DOS INT 21Hand program to simulate CD (Change directory) and PWD (Present Working Directory) commands.

8) Write an assignment on Disk Storage Organization i.e. track, sector, cylinder, cluster, disk system area, data area and disk processing functions 02H(Read Sector), 03H (Write sector) of BIOS INT 13H.

9) Write a program to read any sector from floppy and display the contents of that sector on the screen.

10) Write an assignment on Printer Control Characters i.e. Horizontal TAB, Line Feed, Form Feed, Carriage Return, Printer function 40H, 05H of DOS INT 21 H and 00H (Print character) of BIOS INT 17H and program to print ASCII character set on printer.

11) Write a program to display the status of Flag register and Machine Status Word register of 286 on the screen.

12) Write a program to display the status of Flag register and Machine Status Word register of 386 on the screen.

Learning Recourses:

1. Books

Sr. No.	Author	Book Title	Publication
01	Peter Abel	IBM-PC assembly language & programming	Prentice Hall India
02	A. K. Ray. K. M. Bhurchandi	Advanced microprocessor & peripheral	TATA McGraw Hill
03	Ray Duncan	Advanced MS. DOS Programming	BPB Publication

2. Website:

- **www.intel.com**
- **www.pcguide.com/ref/CPU**
- **www.techsource.com /engineering_parts/microprocessor.html**

Demo lectures with power point presentations using LCD projector should be arranged to develop programming concepts of students.