

3/4 Year B. Tech SIXTH SEMESTER

EM6T2

ADVANCED MP &MC

Credits: 4

Lecture: 4 periods/week

Internal assessment : 30 marks

Tutorial: 1 period /week

Semester end examination: 70 marks

Course Objectives:

- To familiarize the concepts of 8086 organization , architecture & instruction set
- To familiarize the concepts of ARM processor,8051 Microcontroller organization, architecture & instruction set

Learning outcome:

At the end of this course, the students will be able to

- Know the fundamentals of 8086 architecture, Functioning
- Write 8086 &8051 programming in assembly language
- Know ARM processor architecture and instruction set

UNIT-I

8086 Microprocessor : Architecture of 8086 Microprocessor. Special functions of General purpose registers. 8086 flag register and function of 8086 Flags. Pin diagram of 8086-Minimum mode and maximum mode of operation.

Unit II

8086 instruction set: Addressing modes of 8086. Instruction set of 8086. Assembler directives. Assembly language programs involving logical, Branch & Call instructions, sorting,, string manipulation. procedures, and macros.

Unit III

Memory interfacing: Memory interfacing to 8086 (Static RAM & EPROM). Need for DMA. DMA data transfer Method. Interfacing with 8237/8257.

UNIT-IV

Serial communication: Serial data transfer schemes. Asynchronous and Synchronous data transfer schemes. 8251 USART architecture and interfacing. TTL to RS 232C and RS232C to TTL conversion. Sample program of serial data transfer. Introduction to High-speed serial communications standards, USB.

UNIT -V

8051 Microcontroller: 8051 Microcontroller Architecture, Register set of 8051, Modes of timer operation, Serial port operation, Interrupt structure of 8051, Memory and I/O interfacing of 8051.

UNIT -VI

8051 ALP: 8051 Assembly Language Programming (JUMP, LOOP, CALL Instructions), I/O Port Programming, Instructions set. Microcontroller Interrupts and Interfacing to 8255:- 8051 Interrupts, Interfacing to 8259.

UNIT- VII

ARM processor: Evolution of ARM processors, ARMv7 architecture, The ARM's programming model ARM development tools, Examples

UNIT-VIII

ARM processor instruction set: ARMv7 Instruction set architecture, Data Processing instructions, Data transfer instructions, control flow instructions, Writing assembly language programmes, Basic interrupts configuration, Examples

Learning resources

TEXT BOOKS:

1. Advanced Microprocessor and Peripherals (Architecture, Programming & Interfacing) by A.K. Roy & K.M. Bhurchandi – TMH Publication.
2. 8051 Microcontroller & Embedded Systems by Mazidi & Mazidi – Pearson / PHI publication
3. Microcontrollers [theory and applications] TMH publication by Ajay V. Deshmukh.
4. Microprocessors and interfacing - Douglas V. Hall, TMH, 2nd Edition, 1999.
5. The definitive guide to the ARM cortex-M3 - Joseph Yiu 2nd Edition

REFERENCES:

1. Microprocessors 8086/ 8088 - Avatar Singh and Triebel, PHI.
2. Assembly Language Techniques for the IBM PC - Alan R, Miller, BPB (for DOS and BIOS interrupts only)
3. Design with PIC Micro Controllers – John B. Peatman, 2005.
4. 8051 Micro Controllers and Embedded Systems – Dr. Rajiv Kapadia, Jaico Publishers