IIII Year B.Tech. ECE I - Semester

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EC319 MICROPROCESSOR AND MICROCONTROLLERS

Course Description & Objectives:

This course introduces basic architecture and operation of microprocessor and microcontroller to the student. The course objective is to study the architecture and addressing modes of 8086/8051 and to know the importance of different peripheral devices and their interfacing to 8086.

Course Outcome:

Upon successful completion of this course, students should be able to:

a. *Impart knowledge on the architecture and software aspects of microprocessor 8086*
b. *Write assembly language program in 8086 for various application.*
c. *Create the memory and IO interfacing techniques with 8086 and 8051*
d. *Give an overview on the architecture and basic concepts of microcontroller*
e. *Write assembly language program in microcontroller 8051 for various application*

UNIT I - Introduction to 8086 microprocessor :

Evolution of microprocessors, 8086 microprocessor, architecture, register model, memory segmentation, physical address generation, addressing modes, instruction set, Interrupts of 8086, Interrupt vector table.

UNIT II - Hardware features of 8086 :

Pin diagram of 8086, multiplexed ADD/DATA and ADD/STATUS buses, control bus, minimum and maximum modes, Memory READ/WRITE and I/O READ/ WRITE machine cycles, machine cycle with WAIT states. Physical Memory

organization & memory interfacing to 8086.

UNIT III - I/O Interfacing Comparing I/O mapped I/O and memory mapped I/O. 8255 PPI :

Architecture, Modes of operation and Interfacing to 8086. A/D and D/A converter interfacing. 8259 PIC: Architecture, Initialization and operation of 8259, Interfacing of 8259 to 8086. Introduction to Serial Data Communication: Types of serial data transfers & serial data transmission modes. 8251 USART: Architecture, Interfacing of 8251 to 8086.

UNIT IV - Introduction to 8051 Microcontroller :

Comparing microprocessors and microcontrollers, 8051 Micro controller Architecture, Signal Description of 8051, memory organization, Addressing modes of 8051, Instruction set, Assembly language program examples in 8051.

UNIT V - 8051 Microcontroller Hardware :

Parallel Ports in 8051, External Memory interfacing with 8051, 8051 Timers, 8051 Serial ports, 8051 Interrupts. Introduction to ARM7TD

TEXT BOOKS :

1. Douglas V.Hall, “Microprocessors & Interfacing”, 2nd ed., TMH, 2003.
2. Kenneth J. Ayala, “8051 Microcontrollers”, Cengage Learning, 2008.

REFERENCE BOOKS :

1. A K Ray and K M Bhurchandi, “Advanced Microprocessors & Peripherals”, 2nd ed., TMH, 2006.
2. Raj Kamal, “Microcontroller architecture, programming, Interfacing and System Design”, Pearson Education, 2005
3. The 8051 Microcontroller and Embedded Systems using Assembly and C – Muhammad Ali Mazidi, Janice Gillispie Mazidi, Rolin D. McKinlay, 2nd Edition, Pearson Education, 2008.
4. Barry B.Brey: Intel Microprocessor Architecture, Programming and Interfacing- 8086/8088, 80186, 80286, 80386 and 80486,PHI,1995.