EE503PC: MICROPROCESSORS & MICROCONTROLLERS

III Year B.Tech. EEE I-Sem   **L T P C**
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Prerequisite: Programming, Digital Electronics
Course Objectives:
- To develop an understanding of the operations of microprocessors and micro controllers
- To understand machine language programming and interfacing techniques.
- To gain knowledge about input output and memory systems.

Course Outcomes: At the end of this course, students will be able to:
- Understand the internal architecture and organization of 8086, 8051 and ARM processors/controllers.
- Understand the interfacing techniques to 8086 and 8051
- Develop assembly language programming to design microprocessor/ micro controller-based systems.

UNIT-I:
8086 Architecture-Pin diagram, Register Organization, Memory Segmentation, Programming Model, Modes of operation, Timing diagrams, Memory addresses, Physical Memory Organization, interrupts of 8086.
Instruction Set And Assembly Language Programming Of 8086: Instruction formats, addressing modes, Instruction Set, Assembler Directives, Macros, and Simple Programs involving Logical, Branch and Call Instructions, Sorting, String Manipulations, Software Debugging tools, MDS.

UNIT-II:
I/O Interface: 8255 PPI, Various modes of operations and interface of I/O devices to 8086, A/D, D/A Converter Interfacing.
Interfacing With Advanced Devices: 8086 System bus structure, Memory and I/O Interfacing with 8086, Interfacing through various IC Peripheral Chips, 8257 (DMA Controller), 8259 (Interrupt Priority Control).

UNIT-III:
Communication Interface: Serial Communication Standards, USART Interfacing RS-232, IEEE-488, 20mA Current Loop, Prototyping and Troubleshooting,

UNIT-IV:
Introduction To Micro Controllers: Overview of 8051 Micro Controller, Architecture, I/O ports and Memory Organization, addressing modes and Instruction set of 8051, Simple Programs using Stack Pointer, Assembly language programming of 8051
Interrupts Communication: Interrupts - Timer/Counter and Serial Communication, Interrupt Priority in the 8051, Programming of 8051- Timers, Counters and Interrupts.

UNIT-V:
Interfacing And Industrial Applications: Applications of Micro Controllers, Interfacing 8051 to LED's, Keyboard Interfacing, Interfacing Seven Segment Display, ADC and DAC Interfacing, Stepper Motor Interfacing

TEXT BOOKS:
1. Advanced Microprocessors and Peripherals – A. K. Ray and K.M. Bhurchandani, MHE, 2nd Edition 2006.
2. The 8051 Microcontroller, Kenneth. J. Ayala, Cengage Learning, 3rd Ed.

REFERENCE BOOKS:
1. ARM System Developers guide, Andrew N SLOSS, Dominic SYMES, Chris WRIGHT, Elsevier, 2012
2. Microprocessors and Interfacing, D. V. Hall, MGH, 2nd Edition 2006.
3. Introduction to Embedded Systems, Shibu K.V, MHE, 2009
4. The 8051 Microcontrollers, Architecture and Programming and Applications -K.Uma Rao, Andhe Pallavi, Pearson, 2009.