**II Year MCA II Semester**

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## MC214  MICROPROCESSORS & INTERFACING
## ELECTIVE– II

***Objective of the Course:***
The course discusses the evolution of microprocessors; It is a 16-bit microprocessor. Its hardware, instructions, addressing modes, assembly language programming, interfacing memory and I/O devices, also A/D and D/A converter interfacing, data acquisition and analysis, serial data communication aspects are covered in this course.

**UNIT - I**                                                              **(12 Hrs)**
Introduction to microprocessors, 8086 microprocessor, architecture, register model, main units, 20-bit address generation, instruction classification, addressing modes, I/O addressing.
Assembly language  programming,  structure of  .EXE and .COM  files, writing assembly language  source files, converting them into executable files,  INT 21h services of MSDOS for programming, Debugger, writing simple programs and executing.

**UNIT - II**                                                             **(12 Hrs)**
Assembly language programs for arithmetic operations, logic operations, CALL-RETurn operations, intra and inter segment calls, sorting and string operations. Interrupts of 8086, Interrupt vector table, explanation of interrupts.
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.

**UNIT - III**                                                            **(12 Hrs)**
Interfacing memory to 8086 using simple NAND gate for address decoding, multiple chip interfacing using 74LS138 decoder, Word organized memory interfacing.
8255 PPI, mode set and bit set control word formats, Interfacing to 8086, Key board and display interfacing,  A/D and D/A converter interfacing, digitization of signals using assembly language programmes, storage in the memory and reconstruction, synthesized wave form generation.

**UNIT - IV**                                                             **(12 Hrs)**
8254  Timer,  Control word format for the timer,  Interfacing  8254 with 8086, Generation of a set time delay.
8259 Programmable interrupt controller, interfacing 8259 with 8086,  Interrupt driven data acquisition.

**UNIT - V**                                                                                          **(12 Hrs)**

Direct memory access, Features of 8257 DMA chip, Interfacing 8257 with 8086 and bulk data transfer using DMA.

Serial data communication, 8251 USART, Interfacing 8251 with 8086, Serial data transfer, High speed serial communication and USB.

**Text books**:
1. Microprocessors & Interfacing by Douglas V.Hall, Second edition TMH,2003.
2. Advanced Microprocessors & Peripherals by AK Ray and KM Bhurchandi, Second edition, TMH, 2006
3. Assembly language techniques for the IBM PC by Alan R. Miller ,Sybex  1986

**Reference Books:**
1. The Intel Microprocessors by Barry B. Brey , Pearson Education, 2004.
2. 8086 Microprocessor  Programming and Interfacing by Kenneth J. Ayala, Cengage Learning, 2008.