MICRO PROCESSORS AND INTERFACING

V Semester: IT								
Course Code	**Category**	**Hours / Week**			**Credits**	**Maximum Marks**		
AECB55	**Open Elective**	**L**	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
		3	-	-	3	30	70	100
Contact Classes: 45	**Tutorial Classes: Nil**	**Practical Classes: Nil**				**Total Classes: 45**		

OBJECTIVES:
The students will try to learn:

I   The architecture and operation of microprocessors and microcontrollers.

II   The programming and interfacing of Intel microprocessors, microcontrollers to design processor and controller based circuits.

III   The applications of microprocessors and microcontrollers in the field of Communications, Electronic measurement, control systems, Consumer electronics industry and other real-time systems.

COURSE OUTCOMES:
After successful completion of the course, Students will be able to

CO 1   Outline the internal architecture of 8085, 8086 and 8051 microcomputers to study the functionality.

CO 2   Illustrate the organization of registers and memory in 8086 for programming and memory allocation within processor.

CO 3   Explain various addressing modes and instruction set of target microprocessor and microcontroller useful for writing assembly language programs.

CO 4   Distinguish between minimum mode and maximum mode operation of 8086 microprocessor with timing diagrams.

CO 5   Interpret the functionality of various types of interrupts and their structure for controlling the processor or controller and program execution flow.

CO 6   Demonstrate the internal architecture and various modes of operation of the devices used for interfacing memory and I/O devices with microprocessor.

CO 7   Choose an appropriate data transfer scheme and hardware to perform serial data transfer among the devices.

CO 8   Outline the salient features of 80286, 80386 and RISC processors in relation to basic 8086 microprocessor.

CO 9   Illustrate the paging operation and segmentation of advanced microprocessors for memory management.

CO 10 Interpret the internal building blocks and registers of 8051 microcontroller used to perform serial data transfer, timer operation, interfacing of memory and I/O devices.

CO 11 Build necessary hardware and software interface using microcomputer based systems to provide solution for real world problems.

MODULE -I	INTRODUCTION TO 8 BIT AND 16 BIT MICROPROCESSOR	Classes: 08

An over view of 8085, Architecture of 8086 Microprocessor, register organization of 8086, 8086 flag register. Addressing modes of 8086, Instruction set of 8086. Assembler directives, procedures, and macros. Assembly language programs involving logical, Branch & Call instructions, sorting, evaluation of arithmetic Expressions, string manipulation.

MODULE -II	OPERATION OF 8086 AND INTERRUPTS	Classes: 09

Pin diagram of 8086-Minimum mode and maximum mode of operation with Timing diagrams. Interrupt structure of 8086: Vector interrupt table, Interrupt service routines. Introduction to DOS and BIOS interrupts.

MODULE -III	INTERFACING WITH 8086	Classes: 09

Memory interfacing to 8086 (Static RAM & EPROM). Need for DMA, DMA data transfer Method, Interfacing with 8237/8257. 8259 PIC Architecture and interfacing cascading of interrupt controller and its importance.
Serial data transfer schemes: Asynchronous and Synchronous data transfer schemes. 8251 USART architecture and interfacing. TTL to RS 232C and RS232C to TTL conversion.

MODULE -IV	ADVANCED MICRO PROCESSORS	Classes: 09

Introduction to 80286, Salient Features of 80386, Real and Protected Mode Segmentation & Paging, Salient Features of Pentium, Branch Prediction, and Overview of RISC Processors.

MODULE -V	8051 MICROCONTROLLER ARCHITECTURE	Classes: 10

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

Text Books:

1. A.K.Ray and K.M.Bhurchandi, ―Advanced Microprocessor and Peripherals‖, TMH, 2000.
2. Deshmukh, ―Micro Controllers‖, Tata McGraw Hill Edition, TMH, 2000

Reference Books:

1. Douglas U, ―Micro Processors & Interfacing‖, Hall, 2007.
2. By Liu, GA Gibson, ―Micro Computer System 8086/8088 Family Architecture, Programming and Design‖, PHI, 2nd Edition, 2007.

Web References:

1. http://www.nptel.ac.in/downloads/106108100/
2. http://www.the8051microcontroller.com/web-references
3. http://www.iare.ac.in

E-Text Books:

1. https://books.google.co.in/books
2. http://www.www.jntubook.com
3. http://www.ebooklibrary.org/articles/mpmc