MICROPROCESSORS AND INTERFACING

V Semester: CSE | VI Semester: IT

Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
AEC021	Core	3	-	-	3	30	70	100
Contact Classes: 45	Tutorial Classes: 15	Practical Classes: Nil				Total Classes: 60		

I. COURSE OVERVIEW:

Microprocessors are the key components in most of the modern embedded and system-on-chip designs. This course outlines the architecture and signal description of Intel microprocessors. The instruction set and assembly language programming along with I/O and memory interfacing techniques are cov-ered. The knowledge acquired from this course will enable the students in development of embedded hardware projects and models for engineering and scientific applications.

II. OBJECTIVES:

The course should enable the students to:

I The signal descriptions along with functional architecture and hardware interfacing skills using microprocessors.

II The instruction set and logic to build assembly language programs for arithmetic,logic and automated electronic systems.

III The essential concepts of development through a practical hands-on approach on advanced ARM processors and Internet of Things based systems.

III. COURSE OUTCOMES:

After successful completion of the course, students should be able to:

CO 1	**Outline** the functional components of microprocessors forunderstanding the operation of architectures.	Understand
CO 2	**Make use of** addressing modes and instruction set of target microprocessors for writing an assembly language programs to performa task.	Apply
CO 3	**Demonstrate** the internal architecture and modes of operation ofperipheral devices for interfacing memory and I/O devices.	Understand
CO 4	**Illustrate** the interrupt handling mechanism in microprocessors using interrupt controller.	Understand
CO 5	**Choose** an appropriate data transfer scheme and hardware for datatransfer between the devices.	Apply
CO 6	**Develop** microprocessor based applications using necessary input andoutput devices.	Apply

IV. SYLLABUS:

UNIT-I	OVER OF 8086 MICROPROCESSOR	Classes: 08

Introduction to 8085 microprocessor. RISC and CISC processors, architecture of 8086 microprocessor, special functions of general purpose register, 8086 flag register and function of 8086 flags, addressing modes of 8086, instruction set of 8086, assembler directives, simple programs, procedures, and macros.

UNIT-II	PIN DIAGRAM OF 8086 AND AEESMBLY LANGUAGE PROGRAMMING	Classes: 09

Minimum mode and maximum mode of operation, timing diagram, memory interfacing to 8086 (Static RAM and EPROM), need for DMA, DMA data transfer method, interfacing with 8237/8257; Assembly language programs: Assembly language programs involving logical, branch and call instructions, sorting, evaluation of arithmetic expressions, string manipulation.

UNIT-III	8255 PROGRAMMABLE PERIPHERAL INTERFACE (PPI)	Classes: 09

Various modes of 8255 operation and interfacing to 8086; Interfacing keyboard, displays, 8279 Stepper motor and actuators, digital to analog and analog to digital converter interfacing.

Interrupt structure of 8086: Interrupt structure of 8086, Vector interrupt table, interrupt service routines; Introduction to DOS and BIOS interrupts, 8259 PIC architecture and interfacing cascading of interrupt controller and its importance.

UNIT-IV	SERIAL DATA TRANSFER SCHEMES	Classes: 10

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	ADVANCED MICROPROCESSORS	Classes: 09

80286 microprocessor: Architecture, registers (Real/Protected mode), privilege levels, descriptor cache, memory access in GDT and LDT, multitasking, addressing modes; Flag register 80386: Architecture, register organization, memory access in protected mode, paging; 80486: Only the technical features

Text Books:

1. D. V. Hall, "Microprocessors and Interfacing", Tata McGraw-Hill Education, 3rd Edition 2013.
2. A.K Ray, K. M. Bhurchandani, "Advanced Microprocessors and Peripherals", Tata McGraw-Hill Education, 2nd Edition, 2006.
3. Savaliya M. T, "8086 Programming and Advance Processor Architecture", Wiley India Pvt., 1st Edition, 2012.

Reference Books:

1. N. Senthil Kumar, M. Saravanan, S. Jeevanathan, S. K. Shah," Microprocessors and Interfacing", Oxford University, 1st Edition, 2012.
2. Lyla B. Das, "The x86 Microprocessors", Pearson India, 2nd Edition, 2014
3. Daniel Tabak, "Advanced Microprocessors", Addison-Wesley, 2nd Edition, 1996.
4. Triebel, Singh, "The 8088 and 8086 Microprocessors", PHI, 4th Edition 2003.

Web References:

1. http://www.daenotes.com/electronics/digital-electronics/Intel-80858bitmicroprocessor#axzz2I9yUSe7I
2. https://www.smartzworld.com/notes/microprocessors-and-microcontrollers-mpmc/
3. http://www.iare.ac.in

E-Text Books:

1. http://www.www.jntubook.com
2. http://www.freepdfbook.com/micro-processors-and-interfacing/
3. http://engineersevanigam.blogspot.in/2013/07/microprocessors-and-interfacing-by.html
4. https://www.scribd.com/doc/153593067/Microprocessor-by-A-P-Godse-D-A-Godse

Course Home Page: