INSTITUTE OF AERONAUTICAL ENGINEERING
(Autonomous)
Dundigal - 500 043, Hyderabad, Telangana

COURSE CONTENT

MICROPROCESSORS AND INTERFACING								
VII Semester: ECE								
Course Code	**Category**	**Hours / Week**			**Credits**	**Maximum Marks**		
AECD59	**Open Elective**	**L**	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
		3	-	-	3	40	60	100
Contact Classes: 48	**Tutorial Classes: Nil**	**Practical Classes: Nil**				**Total Classes: 48**		
Prerequisite: Electrical Circuits								

I. COURSE OVERVIEW:
Processor and controller cores 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 microprocessor and microcontrollers. The instruction set and assembly language programming along with I/O and memory interfacing techniques are covered. The knowledge acquired from this course will enable the students in development of embedded hardware projects and models for engineering and scientific applications.

II. COURSES OBJECTIVES:
The students will try to learn

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 Internet of Things based systems.

III. COURSE OUTCOMES:
At the end of the course students should be able to:

CO 1 Describe the features of intel processors and micro controllers for signal description and architecture.
CO 2 Make use of addressing modes and instruction set of target microprocessors for writing efficient assembly language programs.
CO 3 Demonstrate the internal architecture and modes of operation of peripheral devices for interfacing memory and I/O devices.
CO 4 Illustrate the interrupt handling mechanism in microprocessors using interrupt controller.
CO 5 Choose an appropriate data transfer scheme and hardware for data transfer between the devices.
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IV. COURSE CONTENT:

MODULE - I: INTRODUCTION TO 8085 MICROPROCESSORS (09)

Development of microprocessors, 8085 Microprocessor - Architecture, Organization, Instruction set, Addressing modes, Basic Timing Diagrams, Interrupts and Simple Programs.

MODULE –II INTRODUCTION TO 8086 MICROPROCESSORS (09)

Microprocessor - Architecture, Organization, Instruction set, Addressing modes, Interrupt system. Pin diagram, Minimum mode 8086 system and timings, Maximum mode 8086 system and timings.

MODULE –III: ASSEMBLY LANGUAGE PROGRAMMING (10)

Assembler directives, Assembly language programs (8086) with Assembler directives for addition, subtraction, multiplication, division etc., sorting and searching, bit manipulation, look-up tables, string manipulations, Macros and Delay subroutines, Debugging.

MODULE –IV DATA TRANSFER SCHEMES AND PERIPHERAL INTERFACING (10)

Synchronous, Asynchronous, Interrupt driven and DMA type schemes, 8255 PPI and its interfacing, Programmable Communication Interface (8251 USART) and its interfacing, Programmable Interval Timer (8254) and its interfacing, Programmable interrupt controller (8259) and its interfacing, Programmable DMA controller (8257) and its interfacing.

MODULE –V: MEMORY AND I/O INTERFACING TO 8086 (09)

Address decoding techniques, Interfacing Static RAM and ROM chips, ADC and DAC Interfacing.

V. TEXT BOOKS:

1. Ramesh S. Gaonkar, “Microprocessor architecture, programming and its applications with 8085”, Penram International Publications, 4th Edition, 2008.
2. A. K. Ray and K.M. Bhurchandi, "Advanced Microprocessors and Peripherals", TMH.
   Douglas V. Hall, "Microprocessors and Interfacing: Programming and Hardware", Tata McGraw-Hill, 2nd Edition, 2007.

VI. REFERENCE BOOKS:

1. Raj Kamal, Microcontrollers Architecture, Programming, Interfacing and System Design, Pearson Education, 2005.
2. Steve Furbur, ARM System on chip Architecture, Addison Wesley, 2nd Edition, 2000.
3. Y. Liu and Glenn A. Gibson, “Microcomputer Systems: 8086/8088 Family Architecture, Programming and Design”, 2nd Edition, PHI.

VII. ELECTRONICS RESOURCES:

1. NPTEL :: Electrical, Electronics and Communication: Microprocessors and Interfacing
2. NPTEL :: Electronics and Communication: Microprocessors and Microcontrollers

VIII. MATERIALS ONLINE

1. Course template
2. Tutorial question bank
3. Tech talk topics
4. Open end experiments
5. Definitions and terminology
6. Assignments
7. Model question paper – I
8. Model question paper - II
9. Lecture notes
10. E-learning readiness videos (ELRV)
11. Power point presentation