**19EC3101-MICROPROCESSORS AND MICROCONTROLLERS**

(Common to ECE & EEE)

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| **Course Category:** | | Program core | | **Credits:** | 3 |
| **Course Type:** | | Theory | | **Lecture - Tutorial - Practical:** | 3 - 0 – 0 |
| **Prerequisite:** | | Computer architecture and Basic programming. | | **Sessional Evaluation :**  **External Evaluation:**  **Total Marks:** | 40  60  100 |
| **Course**  **Objectives** | Students undergoing this course are expected tounderstand: | | | | |
| 1. The history and need of different types of microprocessors and learn the internal architecture details, pin configuration, and their timing diagrams of 8085µp. 2. And develop various projects, by learning programming, and interfacing details of 8085 microprocessor. 3. The internal architecture details, pin configuration, Interrupts and their timing diagrams of 8086µp, and develop assemble language programs. 4. The internal architecture details, pin configuration, and their timing diagrams of 8051µp. 5. The programming and interfacing details of 8051 microcontroller and memory interfacing too. 6. The internal architecture details, pipelining, addressing modes, and C.P.U. Registers of P.I.C. µc. | | | | |
| **Course Outcomes** | Upon successful completion of the course , the students will be able to: | | | | |
| CO1 | | Understand the evaluation of different types of microprocessors and features of 8085 µp along with memory interfacing. | | |
| CO2 | | Assess and solve basic binary math operations using the microprocessor and explain themicroprocessor 8085 internal architecture and its operation within the area ofmanufacturing and performance. | | |
| CO3 | | Gain the knowledge on internal architecture of 8086µp and its modes of operations along with timing diagrams. | | |
| CO4 | | Design electrical circuitry to the Microcontroller I/O ports in order to interface the processor toexternal devices. | | |
| CO5 | | Illustrate how the different peripherals are interfaced with 8086 µc and develop hardware projects using DAC, ADC, &7-Segment Display. | | |
| CO6 | | Gain the knowledge on internal architecture of 8051µp and its modes of operations along with timing diagrams by which improving programming skills on microcontroller. | | |
| **Course**  **Content**  **Course**  **Content** | **UNIT-I**  **INTRODUCTION TO MICROPROCESSORS:** Types of microprocessors, Features of 8085 microprocessor, Architecture of 8085 microprocessor, pin configuration, Register set, Instruction Cycle, Timing Diagrams, Stack and Subroutines.  **UNIT-II INSTRUCTION SET OF 8085 MICROPROCESSORS:** Addressing modes, Assembly Language Programs (8085) for addition, subtraction, multiplication, division etc., Interrupts of 8085, Memory interfacing of 8085 microprocessor.  **UNIT-III**  **ARCHITECTURE OF 8086 MICROPROCESSOR:** Architecture, pin description, Instruction set, Addressing modes, Interrupt system. Minimum mode and Maximum mode operations of 8086 and its timing diagrams, Assembler directives, Assembly language programs (8086).  **UNIT- IV**  **DATA TRANSFER SCHEMES:** Programmable Communication Interface 8251, Programmable Interrupt Controller (8259) and its interfacing, Programmable DMA controller (8257) and its interfacing, Programmable Interval Timer (8253) and its interfacing.  **UNIT-V**  **MEMORY INTERFACING TO 8086:**Interfacing various types of RAM and ROM chips, PPI (8255) and its interfacing, ADC and DAC Interfacing, Waveform generation, Traffic light controller, Stepper motor control, temperature measurement and control.  **UNIT-VI**  **8051 MICROCONTROLLERS:** Architecture, pin description, Register set, Instruction set. Interrupt structure, timer & serial port operations, Simple Assembly language programs on general arithmetic and logical operations. | | | | |
| **Text Books and Reference Books** | **TEXT BOOKS:**   1. Ram. B, “Fundamentals of Microprocessors and Micro controllers”, DhanpatRai publications. 2. Douglas V. Hall, “Microprocessors and interfacing: Programming and hard ware”, TMH, 2nd edition. 3. The 8051 Micro-Controllers, Kenneth J. Ayala, 3rd Edition, Thomson Publications. 4. Design with PIC Micro-Controllers by John B. Peatman, Pearson Educations.   **REFERENCES BOOKS:**   1. A.K. Ray and K.M. Bhurchandi, “Advanced Microprocessors and Peripherals”, TMH. 2. “Microprocessor Architecture, Programming, and Applications with the 8085” by [Ramesh S. Gaonkar](http://www.goodreads.com/author/show/1283958.Ramesh_S_Gaonkar)”, Prentice Hall of India. 3. Intel Microprocessors 8086/8088, 80186/80188, 80286, 80386, 80486, Pentium, PrentiumProprocessor, Pentium II, III, IV by Barry B.Brey. | | | | |
| **E-Resources** | 1. <http://w3.ualg.pt/~jmcardo/ensino/ihs2004/Benner93.pdf> 2. http://engreric.com/wpcontent/uploads/2014/06/Syllabus\_CECS346\_Fall15.pdf | | | | |

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| **Contribution of Course Outcomes towards achievement of Program Outcomes** | | | | | | | | | | | | | | |
|  | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1 | 3 | 3 | 2 | 2 | 1 | - | - | 1 | - | 2 | - | 2 | 3 | 3 |
| CO2 | 3 | 3 | 2 | 2 | 1 | - | - | 1 | - | 2 | - | 2 | 3 | 2 |
| CO3 | 3 | 3 | 3 | 1 | 1 | - | - | 1 | - | 2 | - | 2 | 2 | 3 |
| CO4 | 3 | 3 | 2 | 2 | 1 | - | - | 1 | - | 2 | - | 2 | 3 | 2 |
| CO5 | 3 | 3 | 2 | 2 | 1 | - | - | 1 | - | 2 | - | 2 | 3 | 3 |
| CO6 | 3 | 3 | 2 | 2 | 1 | - | - | 1 | - | 2 | - | 2 | 2 | 2 |