**20EC31P1-MP & MC LAB**

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| **Course Category:** | Program Core | **Credits:** | 1.5 |
| **Course Type:** | Practical | **Lecture-Tutorial- Practice:** | 0 - 0 - 3 |
| **Prerequisite:** | Basic knowledge in programming C, knowledge in microprocessors and programming | **Sessional Evaluation:**  **External Evaluation :**  **Total Marks:** | 40  60  100 |

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| **Course**  **Objectives** | Students undergoing this course are expected to understand: | |
| 1. The features of the software tool – TASAM simulator.  2. The arithmetic and data transfer instructions of 8086.  3. The various hardware modules to be interfaced with µp and µc.  4. The interfacing knowledge with Microprocessor kit.  5. How to develop the ALP for simple logical and arithmetic operations.  6. Develop assembly language programs for various applications using 8051µc. | |
| **Course Outcomes** | Upon successful completion of the course, the students will be able to: | |
| CO1 | Set up programming strategies and select proper mnemonics and run their program on the training boards. |
| CO2 | Acquire interfacing knowledge with microprocessor kit. |
| CO3 | Design the high-speed communication circuits using serial bus connection. |
| CO4 | Use a commercial CPU(s) as realistic vehicles to demonstrate these concepts by introducing students to CPU instructions and internal register structures |
| CO5 | Understand the full internal workings of a typical simple CPU including the utilization of the various hardware resources during the execution of instructions. |
| CO6 | Develop testing and experimental procedures on Microprocessor and Microcontroller analyse their operation under different cases. |
| **Course**  **Content**  **Course**  **Content** | **LIST OF EXPERIMENTS**   1. Summation & Block Transfer of Data   a) Write and execute 8086 to add the given series of BCD numbers and show the result.  b) Write and execute 8086 A.L.P. to transfer a Block of data from one memory area to another memory area.  c) Write and execute 8086 A.L.P. to perform the following multiplications.   * + 1. Repeated addition     2. Using SHIFT and ADD instruction   d) Write and execute 8086 A.L.P. to perform the following.  1)Binary division  2)BCD division   1. Searching & Sorting Data    1. Write and execute 8086 A.L.P. to find the minimum and maximum number from a given data array    2. Write and execute 8086 A.L.P. to arrange the given data array in ascending order and descending order 2. Logic Controller Module   Write and execute 8086 A.L.P. to design the logical expression using Logic controller interface module   1. Stepper Motor Module   Write and execute 8086 A.L.P. to rotate a stepper motor either in clockwise direction or in anticlockwise direction and to control the speed of rotation   1. Serial Input Display Unit Module (S.I.D.U.)   Write and execute 8086 A.L.P. to display the desired word in a display of serial input display unit interface module   1. Parallel Input Display Unit Module (P.I.D.U.)   Write and execute 8086 A.L.P. to design an up and down counter using P.I.D.U. Interface module   1. Digital to Analog Converter Interface Module   Write and execute 8086 A.L.P. to generate given waveform through  C.R.O. using D.A.C.   1. Arithmetic & Logical operations using 8051. 2. (a) To find smallest number from given array of numbers using 8051.   (b) To find largest number from given array of numbers using 8051.   1. Programming using arithmetic, logical and bit manipulation instructions of 8051. | |
| **Reference Books** | 1. “Advanced Microprocessors & Peripherals”, by A K Ray and K M Bhurchandi, 3rd ed., TMH, 2017. 2. “The 8051 microcontroller and embedded systems”, by Mohamed Ali Mazidi, Janice Gillispie Mazidi, Pearson education, second edition, 2005. | |

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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 | 3 | 3 |
| CO2 | 3 | 3 | 2 | 2 | 1 | - | - | 1 | - | 1 | - | 2 | 3 | 2 |
| CO3 | 3 | 3 | 3 | 1 | 1 | 1 | 1 | 1 | 2 | - | - | 2 | 2 | 3 |
| CO4 | 3 | 3 | 2 | 2 | 1 | 1 | - | 1 | - | - | - | 2 | 2 | 3 |
| CO5 | 3 | 3 | 2 | 2 | 1 | - | - | 1 | 1 | - | - | 2 | 3 | 2 |
| CO6 | 3 | 3 | 2 | 2 | 1 | - | - | 1 | - | - | - | 2 | 3 | 2 |