

MICROPROCESSORS & MICROCONTROLLERS LABORATORY

Objective: The objective of this laboratory is to produce graduates who have understood the basic operation of a microprocessor and microcontroller system along with fundamental programming skills in assembly language. This course makes the student solve engineering programming problems which lays foundation to get specialized in areas like embedded Systems and IOT. In this laboratory, the student will acquire knowledge to develop ALP on arithmetic operations, Logic operations, string operations and DOS/BIOS programs by using TASM Software. They will also gain knowledge how to interface different I/Os with Microprocessors. The student can develop ALP on micro controller 8051 and understand the interfacing of 8051 microcontroller with other peripheral devices.



Sections Handled:

B.Tech III Year II Semester – Microprocessors & Microcontrollers lab - ECE - A&B Sections

B.Tech III Year I Semester – Microprocessors & Microcontrollers lab - EEE

Major Equipment Details:

S.No	Name of the Equipment/Make/Model No	Qty	Unit Price
1	8086/8088based,low cost, Microprocessor Trainer with on-board USB port, LCD, Provision for optional PC Keyboard and User Manual; Model: ESA 86/88E	15	4018
2	8051 family of ,low cost, Microcontroller Trainer with on-board USB port, LCD, Interface for optional PC Keyboard and User Manual; Model: ESA 51E	15	4018
3	8085 based Microprocessor Trainer with User Manual; Model: MPS 85-3	3	3352
4	PowerSupply;+5v@3A;+-12V@250mA;+-30V@100mA;M	33	1225
5	Battery backup for RAM	30	152
6	PC Keyboard	30	613
7	Dual DAC Interface with User Manual; Model: IF-DDAC	5	715
8	16 Channel 8-bit ADC Interface with User Manual;Model:IF-16ADC8	5	1529
9	Calculator type keyboard interface with User Manual; Model: IF-KBD	5	813
10	Elevator interface with User Manual; Model: IF-ELV	5	715
11	Traffic Lights interface with User Manual; Model: IF-TRL	3	715
12	Stepper Motor Interface with Stepper Motor(3Kgcm)&Power Adapter with User Manual; Model: IF-Step	5	2955
13	LCD(16×2) Interface with User Manual; Model: IF LCD	5	1009
14	RS 232 C Cable with 9 pin D-Type male connectors on both ends; Model: CAB RS232C	5	206
15	8251/8253 Study Card Interface with User Manual; Model: IF SC 8251/8253	3	970
16	8255 Study Card Interface with User Manual; Model: IF SC 8255	3	970
17	8259 Study Card Interface with User Manual; Model: IF SC 8259	3	970
18	Cathode Ray Oscilloscope	3	15912
19	HP Pro 3090 Desktop Computer Intel Core 2 Duo E7500 (2.93GHz) Processor. Intel G43 MBD, 2GB RAM, 320GB HDD, DVD Writer. Onboard 10/100/1000 LAN,15.6*TFT Monitor Hp Optical Mouse, HP Keyboard,3 Years Warranty	07	23557.73
20	HP Pro 4000 Desktop Computer/Intel dual core E5800(3.2GHZ),1GB DDR III Ram,320GB HDD, Onboard 10/100/1000 LAN,HP Optical Mouse, HP Keyboard,18.5"TFT Monitor,3 Years Warranty	23	18476.40
21	1HM24AV HP 280 G3 MT DESKTOP INTEL CORE I5-7500 PROCESSOR,8GB RAM,1TB HDD,DOS,HP KEYBOARD&MOUSE,3 YEARS WARRANTY	10	27118.64
22	V5E94AA HP V194 18.5"LED BACKLIT MONITOR	10	4882
23	UPS Eaton 9145 6.0 KVA UPS	1	52380.95
24	Modular Embedded Development Platform 0816118,0816122	2	11960
25	ADC/DAC Module 0117411,1216410	2	4945
26	PIC Microcontroller Development Board with programmer 0217390 to 0217391	2	10293
Total Cost		Rs 14,14,820.238/-	

Faculty Lab In charge with qualification: Mrs.M.Mythri, M.Tech

Lab Technician name with qualification: Mrs.V.Kanaka Durga, DECE

Experiment list as per curriculum:**PART-I: MICROPROCESSOR 8086**

1. Introduction to MASM/TASM.
2. Arithmetic operation- Multi byte Addition and Subtraction, Multiplication and Division- Signed and unsigned Arithmetic operation, ASCII- Arithmetic operation.
3. Logic operations-Shift and rotate- Converting packed BCD to unpacked BCD, BCD to ASCII conversion.
4. By using string operation and Instruction prefix: Move Block, Reverse string, Sorting, Inserting, Deleting, Length of the string, String comparison.
5. DOS/BIOS programming : Reading keyboard (Buffered with and without echo) - Display characters, Strings.

PART-II: INTERFACING WITH MICROPROCESSOR

1. 8259 – Interrupt Controller-Generate an interrupt using 8259 timer.
2. 8279 – Keyboard Display- Write a program to display a string of characters.
3. 8255 – PPI-Write ALP to generate sinusoidal wave using PPI.
4. 8251 – USART-Write a program in ALP to establish Communication between two processors.

PART-III: MICROCONTROLLER 8051

1. Reading and Writing on a parallel port.
2. Timer in different modes.
3. Serial communication implementation.

PART-IV: INTERFACING WITH MICROCONTROLLER

Write C programs to interface 8051 chip to Interfacing modules to Develop single chip solutions.

1. Simple Calculator using 6 digit seven segment display and Hex Keyboard interface to 8051.
2. Alphanumeric LCD panel and Hex keypad input interface to 8051.
3. External ADC and Temperature control interface to 8051.
4. Generate different waveforms Sine, Square, Triangular, and Ramp etc. using DAC interface to 8051; change the frequency and Amplitude.

Experiment list beyond the curriculum

1. Arithmetic operations using 8051 microcontroller
2. Logical operations using 8051 microcontroller