BTEC-402-18	Credits	L	T	P	Int	Ext
Microprocessors and Microcontrollers	3	3	0	0	40	60

Unit 1: Microprocessor 8085 History of microprocessors; microprocessor 8085 Architecture, Pin configuration; Memory Interfacing; microprocessor programming model; 8085 instructions; Addressing modes; programming techniques, counters and time delays; stack and subroutines; interrupts.

Unit 2: Microcontroller 8051 - Building Blocks Microprocessor vs microcontroller; RISC vs CISC architectures; microcontroller 8051: architecture, pin configuration, flag-bits and PSW register, input-output ports, register banks and stack; semiconductor memories: ROM, SRAM, DRAM, virtual memory, cache memory; memory organization.

Unit 3: Microcontroller 8051 - Programming Assembly language programming; data types and directives; jump loop and call instructions; I/O port programming; addressing modes and accessing memory using various addressing modes; arithmetic instructions and programs; logic instructions and programs; single bit instructions and programming, 8051 interrupts; timer/counter programming in the 8051.

Unit 4: Microcontroller 8051 - Interfacing Parallel and serial ADC&DAC interfacing; LCD interfacing, Keyboard interfacing; sensor interfacing; interfacing with external memory; matrix keypad; stepper motor interfacing; DC motor interfacing and PWM.

Recommended Books

1. R S Gaonkar, Microprocessor Architecture, Programming and Application with 8085, Penram International Publishing Pvt. Ltd.
2. Kenneth Ayala, The 8051 Microcontroller, Cengage Learning
3. Douglas Hall, Microprocessors Interfacing, Tata McGraw Hill
4. Subrata Ghoshal, 8051 Microcontroller: Internals, Instructions, Programming and Interfacing, Pearson Education

Lesson Plan

Lecture No.	Unit	Date/ Week	Topic	Teaching Aids	Reference
L-1	Unit 1	Week-1	Microprocessor 8085	BLACK BOARD & PPT	1. R S Gaonkar, Microprocessor Architecture, Programming and Application with 8085 2. Kenneth Ayala, The 8051 Microcontroller
L-2	Unit 1	Week-1	History of microprocessors;	BLACK BOARD & PPT	1. R S Gaonkar, Microprocessor Architecture, Programming and Application with 8085 2. Kenneth Ayala, The 8051 Microcontroller
L-3	Unit 1	Week-1	microprocessor 8085 Architecture,	BLACK BOARD & PPT	1. R S Gaonkar, Microprocessor Architecture, Programming and Application with 8085 2. Kenneth Ayala, The 8051 Microcontroller
L-4	Unit 1	Week-1	Pin configuration;	BLACK BOARD & PPT	1. R S Gaonkar, Microprocessor Architecture, Programming and Application with 8085 2. Kenneth Ayala, The 8051 Microcontroller
L-5	Unit 1	Week-1	Memory Interfacing;	BLACK BOARD & PPT	1. R S Gaonkar, Microprocessor Architecture, Programming and Application with 8085 2. Kenneth Ayala, The 8051 Microcontroller
L-6	Unit 1	Week-2	microprocessor programming model;	BLACK BOARD & PPT	1. R S Gaonkar, Microprocessor Architecture, Programming and Application with 8085 2. Kenneth Ayala, The 8051 Microcontroller
L-7	Unit 1	Week-2	8085 instructions;	BLACK BOARD & PPT	1. R S Gaonkar, Microprocessor Architecture, Programming and Application with 8085 2. Kenneth Ayala, The 8051 Microcontroller
L-8	Unit 1	Week-2	Addressing modes;	BLACK BOARD & PPT	1. R S Gaonkar, Microprocessor Architecture, Programming and Application with 8085 2. Kenneth Ayala, The 8051 Microcontroller
L-9	Unit 1	Week-2	programming techniques, counters and time	BLACK BOARD & PPT	1. R S Gaonkar, Microprocessor Architecture, Programming and Application with 8085

			delays;		2. Kenneth Ayala, The 8051 Microcontroller
L-10	Unit 1	Week-2	stack and subroutines;	BLACK BOARD & PPT	1. R S Gaonkar, Microprocessor Architecture, Programming and Application with 8085 2. Kenneth Ayala, The 8051 Microcontroller
L-11	Unit 1	Week-2	Interrupts	BLACK BOARD & PPT	1. R S Gaonkar, Microprocessor Architecture, Programming and Application with 8085 2. Kenneth Ayala, The 8051 Microcontroller
L-12	Unit 2	Week-3	Building Blocks of microcontrollers, memory organization	BLACK BOARD & PPT	1. R S Gaonkar, Microprocessor Architecture, Programming and Application with 8085 2. Kenneth Ayala, The 8051 Microcontroller
L-13	Unit-2	Week-3	Microprocessor vs microcontroller;	BLACK BOARD & PPT	1. R S Gaonkar, Microprocessor Architecture, Programming and Application with 8085 2. Kenneth Ayala, The 8051 Microcontroller
L-14	Unit-2	Week-3	RISC vs CISC architectures;	BLACK BOARD & PPT	1. R S Gaonkar, Microprocessor Architecture, Programming and Application with 8085 2. Kenneth Ayala, The 8051 Microcontroller
L-15	Unit-2	Week-3	microcontroller 8051:	BLACK BOARD & PPT	1. R S Gaonkar, Microprocessor Architecture, Programming and Application with 8085 2. Kenneth Ayala, The 8051 Microcontroller
L-15	Unit-2	Week-3	Pin configuration of 8051,	BLACK BOARD & PPT	1. R S Gaonkar, Microprocessor Architecture, Programming and Application with 8085 2. Kenneth Ayala, The 8051 Microcontroller
L-16	Unit-2	Week-4	Architecture 8051	BLACK BOARD & PPT	1. R S Gaonkar, Microprocessor Architecture, Programming and Application with 8085 2. Kenneth Ayala, The 8051 Microcontroller
L-17	Unit-2	Week-4	flag-bits and PSW register,	BLACK BOARD & PPT	1. R S Gaonkar, Microprocessor Architecture, Programming and Application with 8085 2. Kenneth Ayala, The 8051 Microcontroller

L-18	Unit-2	Week-4	input-output ports,	BLACK BOARD & PPT	1. R S Gaonkar, Microprocessor Architecture, Programming and Application with 8085 2. Kenneth Ayala, The 8051 Microcontroller
L-19	Unit-2	Week-4	semiconductor memories: ROM, SRAM, DRAM,	BLACK BOARD & PPT	1. R S Gaonkar, Microprocessor Architecture, Programming and Application with 8085 2. Kenneth Ayala, The 8051 Microcontroller
L-20	Unit-2	Week-4	register banks and stack;	BLACK BOARD & PPT	1. R S Gaonkar, Microprocessor Architecture, Programming and Application with 8085 2. Kenneth Ayala, The 8051 Microcontroller
L-21	Unit-2	Week-5	virtual memory, cache memory;	BLACK BOARD & PPT	1. R S Gaonkar, Microprocessor Architecture, Programming and Application with 8085 2. Kenneth Ayala, The 8051 Microcontroller
L-22	Unit-3	Week-5	Microcontroller 8051	BLACK BOARD & PPT	1. R S Gaonkar, Microprocessor Architecture, Programming and Application with 8085 2. Kenneth Ayala, The 8051 Microcontroller
L-23	Unit-3	Week-5	Programming Assembly language programming;	BLACK BOARD & PPT	1. R S Gaonkar, Microprocessor Architecture, Programming and Application with 8085 2. Kenneth Ayala, The 8051 Microcontroller
L-24	Unit-3	Week-5	Data types and directives;	BLACK BOARD & PPT	1. R S Gaonkar, Microprocessor Architecture, Programming and Application with 8085 2. Kenneth Ayala, The 8051 Microcontroller
L-25	Unit-3	Week-5	Jump loop and call instructions; I/O port programming;	BLACK BOARD & PPT	1. R S Gaonkar, Microprocessor Architecture, Programming and Application with 8085 2. Kenneth Ayala, The 8051 Microcontroller
L-26	Unit-3	Week-6	Addressing modes and accessing memory using various addressing modes;	BLACK BOARD & PPT	1. R S Gaonkar, Microprocessor Architecture, Programming and Application with 8085 2. Kenneth Ayala, The 8051 Microcontroller
L-27	Unit-3	Week-6	Arithmetic instructions and	BLACK BOARD & PPT	1. R S Gaonkar, Microprocessor Architecture, Programming and

			programs;		Application with 8085 2. Kenneth Ayala, The 8051 Microcontroller
L-28	Unit-3	Week-6	Logic instructions and programs;	BLACK BOARD & PPT	1. R S Gaonkar, Microprocessor Architecture, Programming and Application with 8085 2. Kenneth Ayala, The 8051 Microcontroller
L-29	Unit-3	Week-6	Single bit instructions and programming,	BLACK BOARD & PPT	1. R S Gaonkar, Microprocessor Architecture, Programming and Application with 8085 2. Kenneth Ayala, The 8051 Microcontroller
L-30	Unit-3	Week-6	8051 interrupts; timer/counter programming in the 8051.	BLACK BOARD & PPT	1. R S Gaonkar, Microprocessor Architecture, Programming and Application with 8085 2. Kenneth Ayala, The 8051 Microcontroller
L-31	**Unit-4**	Week-7	Interfacing Parallel and serial	BLACK BOARD & PPT	1. R S Gaonkar, Microprocessor Architecture, Programming and Application with 8085 2. Kenneth Ayala, The 8051 Microcontroller
L-32	Unit-4	Week-7	ADC&DAC interfacing;	BLACK BOARD & PPT	1. R S Gaonkar, Microprocessor Architecture, Programming and Application with 8085 2. Kenneth Ayala, The 8051 Microcontroller
L-33	Unit-4	Week-7	LCD interfacing,	BLACK BOARD & PPT	1. R S Gaonkar, Microprocessor Architecture, Programming and Application with 8085 2. Kenneth Ayala, The 8051 Microcontroller
L-34	Unit-4	Week-7	Keyboard interfacing;	BLACK BOARD & PPT	1. R S Gaonkar, Microprocessor Architecture, Programming and Application with 8085 2. Kenneth Ayala, The 8051 Microcontroller
L-35	Unit-4	Week-8	sensor interfacing;	BLACK BOARD & PPT	1. R S Gaonkar, Microprocessor Architecture, Programming and Application with 8085 2. Kenneth Ayala, The 8051 Microcontroller
L-36	Unit-4	Week-8	interfacing with external memory;	BLACK BOARD & PPT	1. R S Gaonkar, Microprocessor Architecture, Programming and Application with 8085 2. Kenneth Ayala, The 8051

					Microcontroller
L-37	Unit-4	Week-8	matrix keypad;	BLACK BOARD & PPT	1. R S Gaonkar, Microprocessor Architecture, Programming and Application with 8085 2. Kenneth Ayala, The 8051 Microcontroller
L-38	Unit-4	Week-8	stepper motor interfacing;	BLACK BOARD & PPT	1. R S Gaonkar, Microprocessor Architecture, Programming and Application with 8085 2. Kenneth Ayala, The 8051 Microcontroller
L-39	Unit-4	Week-8	DC motor interfacing and PWM.	BLACK BOARD & PPT	1. R S Gaonkar, Microprocessor Architecture, Programming and Application with 8085 2. Kenneth Ayala, The 8051 Microcontroller