



M. C. E. Society's

Abeda Inamdar Senior College

Of Arts, Science and Commerce, Camp, Pune-1

(Autonomous) Affiliated to Savitribai Phule Pune University

NAAC accredited 'A' Grade

B.C.A. (Science) (Minor) as per NEP

(CBCS – Autonomy 21 Pattern)

Course Offered as	Minor (Theory)
Course/ Paper Title	8051 Microcontroller Programming
Course Code	23SBCA41MNB
Semester	III
No. of Credits	2
No of Hours	30

Aims & Objectives of the Course:

Sr. No.	Objectives
1	To study the basics of 8051microcontroller
2	To understand the internal architecture of 8051 Microcontrollers.
3	To understand and acquire knowledge in programming 8051 Microcontroller using assembly and Embedded C
4	To study the interfacing techniques of 8051microcontroller

Expected Course Specific Learning Outcome

Sr. No.	Learning Outcome
1.	Understands basics and architecture of 8051 Microcontroller
2.	Write 8051 Assembly level programs using 8051 instructions Set and C
3.	Interface simple switches, simple LEDs, LCD , DC motor and Stepper Motor to 8051 using 8051 I/O ports.
4.	Design 8051 Microcontroller based applications.
5.	The students can design mini project based on 8051 microcontrollers using Assembly and/or C language.

Syllabus

Unit No	Title with Contents	No. of Lectures
Unit I	The 8051 Architecture	10
	<ol style="list-style-type: none"> 1. Introduction to the concepts of microprocessors and microcontrollers 2. Architecture of 8051 microcontroller 3. Features of 8051 microcontroller 4. Functional Pin out diagram and description of pins 5. Special function registers (SFRs) 6. Memory Organization 7. Interrupts 	
Unit II	8051 Instruction Set and Programming	16
	<ol style="list-style-type: none"> 1. Classification of Instruction Set: Data transfer group, Arithmetic group, Logical group, Branching group, Bit Manipulation Group. 2. Addressing modes - Immediate, register, direct, register indirect and indexed addressing modes 3. Features of machine language, assembly language, middle-level and high-level languages. 4. Programs using Assembly Language Arithmetic Operations, Sum of n-numbers, Block transfer, Finding smallest and largest number from a set of numbers. Assembly language programming for interfacing LED 5. Embedded C and Programming. 	
Unit III	Interfacing the 8051 with Peripherals	10
	<ol style="list-style-type: none"> 1) Interfacing of LEDs 2) Interfacing of 7-Segment LED Display 3) Interfacing of Switches 4) Interfacing of 16x2 LCD Display 5) Interfacing of DC Motor 	

	6) Interfacing of Stepper motor 7) Interfacing of Servo motor 8) Interfacing of different sensors 9) Interfacing ADC and DAC	
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References:

- 1) Muhammad Ali Mazidi and Janice Gillespie Mazidi and Rollin D. McKinlay , The 8051 Microcontroller and Embedded Systems – using assembly and C, Pearson.
- 2) Kenneth J. Ayala, The 8051 Microcontroller, 3rd Edition, Delmar Cengage Learning
- 3) Manish K Patel ,The 8051 Microcontroller Based Embedded Systems , McGraw Hill
- 4) Raj Kamal ,Microcontrollers: Architecture, Programming, Interfacing and System Design, Pearson Education.
- 5) Rao, Dr. K Uma, The 8051 Microcontrollers: Architecture, Programming and Applications, Pearson Education India, New Delhi