SARDAR PATEL UNIVERSITY
Vallabh Vidyanagar, Gujarat
(Reaccredited with 'A' Grade by NAAC (CGPA 3.25)
Syllabus with effect from the Academic Year 2021-2022

Master of Science (Electronics)
M.Sc.(Electronics) Semester I

Course Code	PS01CELE53	Title of the Course	8 Bit Microcontroller and Applications
Total Credits of the Course	4	Hours per Week	3+1=4 Hours

Course Objective	To train students on
	1. Programming of Microcontroller, 2. Interfacing of external peripherals with microcontroller 3. Design of Simple Embedded system using 8051 microcontroller.

Course Content		
UNIT	Description	Weightage* %
1	8051 Microcontroller: Microprocessor Vs Microcontroller, Embedded Systems, Embedded Microcontrollers, 8051 Architecture- Registers, Pin diagram, I/O ports functions, Internal Memory organization. Interfacing Concept: Design of Address decoder circuit and control signal generation. External Memory (ROM & RAM) interfacing.	25
2	8051 Instruction Set: Addressing Modes, Data Transfer instructions, Arithmetic instructions, Logical instructions, Branch instructions, Bit manipulation instructions. Simple Assembly language program examples to use these instructions.	25
3	8051 Timers and Counters:Operation and Assembly language programming to generate a pulse using Mode-1 and a square wave using Mode-2 on a port pin. 8051 Serial Communication- Basics of Serial Data Communication. 8051 Interrupts, 8051 Assembly language programming to generate an external interrupt	25
4	Interfacing 8051 to LED's, Switches, LCD, ADC-0804, DC Motor and Stepper motor with Assembly language programming.	25

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Teaching-Learning Methodology	Traditional Classroom teaching with use of Multimedia facility in the classroom. Use of Computer Tool for live demonstration and problem / design based approach.

Evaluation Pattern		
Sr. No	Details of Evaluation	Weightage
1	Internal Written / Practical Examination (As per CBCS R.6.8.3)	15%
2	Internal Continuous Assessment in the form of Practical, Viva Voce, Quizzes, Seminars, Assignments, Attendance (as per CBCS R6.8.3)	15%
3	University Examination	70%

Course Outcome. Having completed this course, the learner will be able to	
1	Explain the difference between Microprocessors & Microcontrollers, Architecture of 8051 Microcontroller, Interfacing of 8051 to external memory and Instruction set of 8051.
2	Write 8051 Assembly level programs using 8051 instruction set. Explain the Interrupt system, operation of Timers/Counters and Serial port of 8051.
3	Write 8051 programs to generate square wave on 8051 I/O port pin using interrupt and to send & receive serial data using 8051 serial port.
4	Interface simple switches, simple LEDs, ADC 0804, LCD and Stepper Motor to 8051 using 8051 I/O ports.

Suggested References:	
Sr. No.	References
1	"The 8051 Microcontroller and Embedded Systems – using assembly and C ", Muhammad Ali Mazidi and Janice Gillespie Mazidi and Rollin D. McKinlay; PHI, 2006 / Pearson, 2006.
2	"The 8051 Microcontroller", Kenneth J. Ayala, 3rd Edition, Thomson/Cengage Learning.

On-line resources to be used if available as reference material
On line resources.
https://www.mikroe.com/ebooks/architecture-and-programming-of-8051-mcus