Kadi Sarva Vishwavidyalaya
Faculty of Engineering & Technology
Third Year Bachelor of Engineering(EE)
(With Effect from Academic Year 2019-20)

Subject Code:EE502-N	Subject Title: Microprocessor and Microcontroller
Pre-requisite	

Course Objective:

- To understand the study of microprocessor 8085 and microcontroller 8051.
- To study about computer architecture through 8085 microprocessor and microcontroller 8051.
- To develop programming skill through assembly language programming.

Teaching scheme				Total Credit	Evaluation Scheme					Total Marks
					Theory		IE Marks	CIA Marks	Practical. Marks	
L	T	P	Total		Hrs	Marks				
Hrs	Hrs	Hrs	Hrs							
04	00	02	06	05	03	70	30	20	30	150

Outline of the Course:

Sr. No	Title of the Unit	Minimum Hours
1	Introduction to 8085 Microprocessor	06
2	The Architecture of 8085	12
3	Introduction of instruction set and Programming Of 8085	12
4	Introduction to 8051	08
5	Architecture of 8051	12
6	Assembly Language Programming of 8051	10

Total Hours (Theory): 60
Total Hours (Lab): 30
Total Hours: 90

Detailed Syllabus

Sr. No.	Topic	Lecture Hours	Weight age(%)
1	**Introduction to 8085 Microprocessor:** Introduction to microprocessor, Functional Component of microprocessor, Evolution of Microprocessor, Microprocessor systems with bus organization, Microprocessor Architecture & Operations, Memory, I/O Device, Memory and I/O Operations.	6	08
2	**The Architecture of 8085:** Introduction of 8085 Microprocessor Architecture and its operation, Address, Data And Control Buses, Pin Functions, Demultiplexing Of Buses, Generation Of Control Signals, Instruction Cycle, Machine Cycles, T-States, Memory Interfacing.	12	25
3	**Introduction of instruction set and Programming Of 8085:** Introduction to 8085 instructions, Addressing Modes, Writing Assembling & Executing A Program, Debugging The Programs, Decision Making, Looping, Stack & Subroutines, Conditional Call & Return Instructions, Developing Counters And Time Delay Routines, Code Conversion, BCD Arithmetic And 16-Bit Data Operations.	12	25
4	**Introduction to 8051:** Introduction to 8051, Embedded systems, Microprocessor vs. Microcontrollers., Desirable Features of embedded systems, Overview to 8051 family, Introduction to Harvard Architecture, RISC, CISC.	08	12
5.	**Architecture of 8051**: 8051 microcontroller hardware: Oscillator and Clock, Role of PC and DPTR, Flags and PSW, Internal RAM and RAM organization, ROM space in the 8051, 8051 data types and directives, Special Function Registers, I/O pins, External memory, Counter and Timers, Serial Transmission and Interrupts.	12	15
6.	**Assembly Language Programming of 8051:** Assembly language programming, Addressing Modes, Arithmetic and Logical Instructions, Jump Loop and Call Instructions, I/O Port Programming, 8051 timer programming, interrupt programming ,serial port and its programming.	10	15
	Total	60	100

Instructional Method and Pedagogy:
- At the start of course, the course delivery pattern , prerequisite of the subject will be discussed
- Lecture may be conducted with the aid of multi-media projector, black board, OHP etc.
- Attendance is compulsory in lectures and laboratory, which may carries five marks in overall evaluation.
- One internal exam of 30 marks is conducted as a part of mid semester evaluation.
- Assignment based on course content will be given to the student for each unit/topic and will be evaluated at regular interval. It may carry a weight age of five marks in the overall internal evaluation.
- Surprise tests/Quizzes/Seminar /Tutorial may be conducted and having share of five marks in the overall internal evaluation.

- The course includes a laboratory, where students have an opportunity to build an appreciation for the concept being taught in lectures.
- Experiments shall be performed in the laboratory related to course contents.

Learning Outcome

- On successful completion of the course, the student should be able to apply concepts of Microprocessor and microcontroller 8051 for development of real world problems.
- Able to differentiate architecture of microprocessor and microcontrollers.
- Able to understand programming in assembly of 8085 and 8051.

Text Books:

- Ramesh Gaonkar, 'Microprocessor Architecture, Programming & application with 8085', Fifth
- Edition, Penram Publications.
- Kenneth J. Ayala, 'The 8051 microcontroller', Cengage Learning, 2004
- Muhammad Ali Mazidi, Janice Gillispie Mazidi, Rolin D. McKinlay, 'The 8051 Microcontroller and Embedded Systems', Second Edition, Pearson Prentice Hall.

Reference Books:

- B. Ram, 'Fundamentals of Microprocessors and Microcomputers', Dhanpat Rai Publications.
- Microcomputers and Microprocessors: The 8080,8085 and Z-80 Programming, Interfacing and
- Troubleshooting by John E. Uffenbeck.
- 8051 Microcontrollers: MCS51 family and its variants by Satish Shah, Oxford University Press.
- Programming and Customizing the 8051 Microcontroller by Myke Predko Tata McGraw Hill.

List of experiments:

Sr. No.	Name of experiment
1.	To study internal architecture of 8085microprocessor
2.	To study pin diagram of 8085 microprocessor.
3.	Introduction to 8085 microprocessor –kit.
4.	To perform programs related to data transfer instructions for 8085
5.	To perform programs related to arithmetic and logical instructions for 8085.
6.	To perform programs related to branching and looping instructions for 8085.
7.	To perform programs related to data transfer instructions for 8051.
8	To perform programs related to arithmetic and logical instructions for 8051.
9	To perform programs related to branching and looping instructions for 8051.
10	Program 3(A): Use Assembler Directives to place constants 02H, 67H, 0D2H, 96H and Character LDRP in Consecutive Memory Location beginning from 0050H. Program 3(B): Show the Status of CY, AC and P Flags after addition of 9CH and 64H.
11.	Program 4(A): Write a Program to add two 8 bit Numbers stored in Register R5 and Internal Memory Location 56H and Store Result in Register R3. Program 4(B): Write a Program to subtract two 8 bit Numbers stored in Register R0 and External Memory Location 2000H and Store Result in Internal Memory Location 72H. Program 4(C): Write a Program to divide two 8 bit Numbers stored in Register A and Register B and Store Reminder in R2 Register and Quotient in Register R3.
12.	Write a program to add block of data stored in internal memory locations 30H to 34H and Store Result in Register R4.
13.	Write a program to generate 1 kHz Pulse waveform for 50% duty cycle on Pin 1.0.