

**SES's L. S. RAHEJA COLLEGE OF ARTS AND COMMERCE
(AUTONOMOUS)**



**Syllabus of Microprocessor & Microcontroller Architecture under NEP
2020 vertical - Major with effect from 2024-25**

Department of Information Technology and Data Science

HoD/Sr. Person of the Department: Prajakta Joshi

Date of approval by the BoS: 27/04/2024

Approved by the Academic Council: 29/04/2024

Ratified by the Governing Body on: 06/05/2024



Programme: B.Sc.(IT)			Semester : II		
Course : Microprocessor & Microcontroller Architecture			Code: UGBSCITIIMJ224		
Academic Year: 2024-2025			Batch: 2024-2027		
Teaching Scheme			Evaluation Scheme		
Lectures	Practical	Tutorials	Credits	Internal Continuous Assessment (ICA) (weightage)	Term End Examinations (TEE) (weightage)
45	Nil	Nil	3	40%	60%

Learning Objectives :	1. To understand the basic concept of Micro Computer Systems 2. To develop background knowledge in 8085 Microprocessor 3. To write Assembly language Programs of 8085 4. To understand the peripheral devices and interfacing to 8051 Micro Controller and design aspects of Micro Controller
Learning Outcomes :	1. Understand the basic concepts of Micro Computer Systems 2. Understand the architecture and hardware aspects of 8085 3. Write assembly language programs in 8085 4. Design elementary aspects of Micro Controller based systems 5. Interfacing peripherals using Micro Controller
Pedagogy:	Experiential learning, problem-based learning, peer learning, hardware simulators and kits

Detailed Syllabus: (per session plan)

Session Outline For: Microprocessor & Microcontroller Architecture

Each lecture session would be of one hour duration (45 sessions).

Module	Module Content	Module Wise Pedagogy Used	Module Wise Duration
I	Microprocessor, microcomputers, and Assembly Language: Microprocessor, Microprocessor Instruction Set and Computer Languages, From Large Computers to Single-Chip Microcontrollers, Applications. Microprocessor Architecture and Microcomputer System: Microprocessor Architecture and its operation's, Memory, I/O Devices, Microcomputer System, Logic Devices and Interfacing, Microprocessor-Based System Application. 8085 Microprocessor Architecture and Memory Interface: Introduction, 8085 Microprocessor unit, 8085-Based Microcomputer, Memory Interfacing, Interfacing the 8085 Memory Segment. Interfacing of I/O Devices	Experiential learning, problem-based learning, peer learning	15

	Basic Interfacing concepts, Interfacing Output Displays, Interfacing Input Devices, Memory Mapped I/O, Testing and Troubleshooting I/O Interfacing Circuits.		
II	Introduction to 8085 Assembly Language Programming: The 8085 Programming Model, Instruction Classification, Instruction, Data and Storage, Writing assembling and Execution of a simple program, Overview of 8085 Instruction Set, Writing and Assembling Program. Introduction to 8085 Instructions: Data Transfer Operations, Arithmetic Operations, Logic Operation, Branch Operation, Writing Assembly Languages Programs, Debugging a Program. Programming Techniques With Additional Instructions: Programming Techniques: Looping, Counting and Indexing, Additional Data Transfer and 16-Bit Arithmetic Instructions, Arithmetic Instruction Related to Memory, Logic Operations: Rotate, Logics Operations: Compare, Dynamic Debugging.	Experiential learning, problem-based learning, hardware simulators and kits	15
III	Counters and Time Delays: Counters and Time Delays, Illustrative Program: Hexadecimal Counter, Illustrative Program: zero-to-nine (Modulo Ten) Counter, Generating Pulse Waveforms, Debugging Counter and Time-Delay Programs. Interrupts: The 8085 Interrupt, 8085 Vectored and Non vectored Interrupts, Restart as S/W Instructions. Micro Controllers: Embedded Systems and general purpose computer systems, history, classifications, applications and purpose of embedded systems. The 8051 Microcontrollers: Microcontrollers and Embedded processors, Overview of 8051 family.8051 Microcontroller hardware, Input/output pins, Ports, and Circuits, External Memory. 8051 Programming in C: Data Types and time delay in 8051 C, I/O Programming, Logic operations, Data conversion Programs. Programming embedded systems: structure of embedded program, infinite loop, compiling, linking and debugging. Design and Development: Embedded system, development Environment – IDE, types of file generated on cross compilation, Embedded Product Development cycle and Trends in embedded Industry	Experiential learning, problem-based learning, hardware simulators and kits	15

REFERENCE BOOKS

1. Ramesh Gaonkar, Microprocessors Architecture, Programming and Applications with the 8085, PENRAM
2. Lance A. Leventhel, 8080A/8085 Assembly Language Programming, Osborne
3. Rajkamal, Embedded Systems, Tata Mcgraw- Hill
4. Shibu K V, Introduction to embedded systems, Tata Mcgraw- Hill