

NIRMA UNIVERSITY
Institute of Technology
B. Tech in Electrical Engineering
Semester – V

L	T	P	C
3	0	2	4

Course Code	2EE503
Course Title	Microprocessor and Microcontrollers

Course Outcomes (COs):

At the end of the course, students will be able to –

1. comprehend architecture of 8085 microprocessor and 8051 microcontroller
2. develop algorithm/program of the microprocessor and microcontrollers for an application
3. apply the knowledge of peripheral devices for real world application
4. apply the learning of architecture and operational traits for advanced microcontroller

Syllabus:

Teaching Hours: 45

Unit - 1: 8085 microprocessor, architecture and programming **10**

Introduction and history of microprocessor, 8085 microprocessor and pin diagram, hardware and programming model, concept of address and data bus, interfacing and mapping of i/o and memory, instruction and addressing mode, programming techniques

Unit - 2: 8051 microcontroller architecture **10**

Introduction, 8051 microcontroller internal architecture, I/O pins, ports, counters, timers, interrupts, serial data input/output, special function registers, internal memory organization

Unit -3: Programming of 8051 microcontroller **10**

Programming of 8051 in assembly and C language: addressing modes, data transfer instructions, arithmetic instructions, logical group of instructions, branching instructions, assembly language programming, timing diagrams, data types and time delay in 8051c, i/o programming, serial port programming, timer programming, interrupts programming.

Unit - 4: Applications of 8051 **05**

ADC, DAC, sensor interfacing, microprocessor-based relay applications, LCD interfacing, keyboard interfacing, dc motor interfacing, 8051 interfacing to external memory, embedded C programming for different applications.

Unit - 5: Advanced 8-bit microcontroller **10**

Introduction to C8051F8xx series microcontroller, pipeline architecture and crossbar in cip51 architecture, programming general purpose port, understanding PCA timers and PWM generation, programming in built ADC and communication protocol.

Self-Study:

The self-study contents will be declared at the commencement of semester. Around 10% of the questions will be asked from self-study contents.

Laboratory Work:

This shall consist of at least 10 laboratory experiments / simulations based on the syllabus.

Suggested Readings

1. R. S. Gaonkar, Microprocessor Architecture, Programming and Applications with 8085, Penram International Publications
2. K. J. Ayala, The 8051 Microcontroller Architecture, Programming and Applications, Penram International Publications.
3. Mazidi and Mazidi, 8051 Microcontroller and Embedded system, Pearson Publications.
4. CIP8051Fxx datasheet
5. B. Ram, Fundamentals of Microprocessors and Microcontrollers, Dhanpat Rai Publishing Co.
6. R. S. Kaler, A Textbook of Microprocessors and Microcontrollers, I. K. International Publishing house.

L = Lecture, T = Tutorial, P = Practical, C = Credit

w.e.f. academic year 2020-21 and onwards