NIRMA UNIVERSITY
SCHOOL OF TECHNOLOGY, INSTITUTE OF TECHNOLOGY
B. Tech. Electronics and Communication Engineering
OPEN ELECTIVE

L	T	P	C
2	-	2	3

Course Code	
Course Title	Microcontrollers and Applications

Course Learning Outcomes (CLOs):
At the end of the course, the students will be able to –
1. Comprehend the architecture 8051 microcontroller.
2. Demonstrate Microcontroller programming proficiency.
3. Develop interface logic for interconnection of peripheral devices and motors with microcontroller for given application.

Syllabus: **Teaching Hours: 30**

UNIT I : Introduction of Microcontrollers
Microprocessors and Microcontrollers, Binary and Hex number systems, binary arithmetic, concepts of digital circuits.   **03**

UNIT II : 8051 Architecture and Programming Model
Architecture of 8051 microcontroller, pins of 8051 microcontroller, Interrupts, Timer, Counter, parallel ports, serial Communications, SFRs.   **06**

UNIT III : Programming of 8051 in C
Data types and time delay, I/O programming, arithmetical and logical operations, serial and interrupt programming.   **12**

UNIT IV: Interfacing with 8051
Keypad, LEDs, 7 segment LEDs, LCDs, ADCs, DACs, Sensor Interfacing.   **06**

UNIT V: Motor Control
Relays and opto-isolators, Stepper moto interfacing, DC motor interfacing and PWM.   **03**

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:
Laboratory work will be based on above syllabus with minimum 10 experiments to be incorporated.

Suggested Readings:
1. Kenneth Ayala, The 8051 Microcontroller, Cengage Publications
2. M. A. Mazidi, J. C. Mazidi and R. D. Mckinlay, The 8051 Microcontroller and Embedded System, Pearson Education

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