

NIRMA UNIVERSITY
SCHOOL OF TECHNOLOGY, INSTITUTE OF TECHNOLOGY
B.Tech.

OPEN ELECTIVE

2ECO53 – Arduino for Engineers

Lesson Plan

Course Outcomes (COs):

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

1. Demonstrate programming proficiency using Embedded C for Arduino
2. Interface Analog and Digital peripherals with Arduino
3. Establish serial communication using I2C and SPI protocol
4. Demonstrate proficiency in developing Arduino based applications

Sr. No.	Topic	Hours	CO
1	Introduction to Arduino board and Programming <ul style="list-style-type: none">• The Arduino family• Arduino Uno board• Atmega328p Microcontroller• Programming using Arduino IDE	05 01 01 02 01	1
2	I/O Programming and Interfacing <ul style="list-style-type: none">• LED, push-button switch,• Hex keypad, Seven segment display• LCD interfacing	05 02 02 01	1
3	Serial Communication <ul style="list-style-type: none">• Basics of serial communication Asynchronous serial communication and data framing, Serial port programming,• I2C and SPI communications,• LCD interfacing using I2C	06 02 02 02	3
4	Motor Control <ul style="list-style-type: none">• Interfacing of DC and Stepper motor,• PWM for motor speed control, Relays	06 02 04	2
5	DAC and Sensor Interfacing to Arduino Board <ul style="list-style-type: none">• DAC interfacing• Ultrasonic distance sensor• Humidity and temperature sensor• Infrared sensor, Light sensor (LDR)• Wifi and Bluetooth module	08 01 01 02 02 02	2,3,4
Total Hours		30	

Self-Study:

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

Suggested Readings:

1. Simon Monk, Programming Arduino Getting Started with Sketches, McGraw Hill
2. Jeremy Blum, Exploring Arduino: Tools and Techniques for Engineering Wizardry, Wiley Publishers
3. Michael Margolis, Arduino Cookbook: Recipes to Begin, Expand, and Enhance Your Projects, Oreilly Media
4. Muhammad Mazidi, The 8051 Microcontroller and Embedded Systems using Assembly and C, Pearson Edu.

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