ECE661:ARDUINO

L:3 T:0 P:2 Credits:4

Course Outcomes: Through this course students should be able to

CO1 :: understand basics of microprocessors and microcontrollers

CO2 :: define the basics elements of Arduino development board

CO3 :: apply basic knowledge of programming and Arduino for serial communication

CO4 :: develop various basic modules by interfacing different peripherals with Arduino

CO5 :: analyze the various communication protocols supported by Arduino

CO6 :: integrate the different external devices for creating real world applications

Unit I

Introduction to Arduino Platform : Arduino as open source platform, Types of Arduino boards, Arduino UNO board details, Introduction to Arduino IDE, Structure of Arduino sketch, Uploading the code to Arduino UNO

Serial Communication as debugging tool : Initialization of Arduino UNO serial port, Sending data to Arduino UNO via serial port, Receiving data from Arduino UNO via serial port, Reading switch status with Arduino UNO serial port

Unit II

Programming internal peripherals of Arduino UNO : Specifications of internal ADC, Programming internal ADC, Programming of Arduino UNO PWM, Controlling Arduino UNO PWM with ADC

Unit III

Interfacing output devices : Specifications of 7 – segment, Specifications 16x2 LCD, Introduction to LiquidCrystal library

Unit IV

Interfacing actuators : Introduction to DC motor, Introduction to DC motor driver circuit, Speed and direction control of DC motor with Arduino UNO

Unit V

Interfacing of sensors : Introduction to DHT11 humidity and temperature senso, Interfacing DHT11 with Arduino UNO, Introduction to Ultrasonic sensor with output on LCD

Unit VI

Interfacing communicating module : Introduction to Bluetooth technology, Working with Bluetooth module AT commands, Interfacing Bluetooth with Arduino UNO for data transmission, Controlling Arduino GPIO from phone

List of Practicals / Experiments:

List of Practicals

- Interfacing 7 – segment with Arduino UNO
- Interfacing LCD with Arduino UNO
- Controlling servo motor with Arduino UNO
- Controlling the speed of DC motor with variable resistor using PWM
- Interfacing Ultrasonic sensor with Arduino UNO with output on LCD

References:

1. EXPLORING ARDUINO: TOOLS AND TECHNIQUES FOR ENGINEERING WIZARDRY, 2ND EDITION by JEREMY BLUM, WILEY

2. ARDUINO COOKBOOK BY MICHAEL MARGOLIS, O'REILLY by MICHAEL MARGOLIS, O'REILLY