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 :: learn the basics elements of Arduino development board

CO3 :: examine to connect various sensors to the Arduino board and learn how to read data from sensors and control actuators.

CO4 :: apply basic knowledge of programming and Arduino for serial communication

CO5 :: develop the various communication protocols supported by Arduino

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

Unit I

Introduction to Arduino Platform : ardunio as open source platform, different types of arduino boards, arduino uno board detail, introduction to arduino ide platform, structure of arduino ide, uploading the code to arduino

Serial Communication as debugging tool : initialization of arduino serial port, sending data to arduino via serial port, receiving data from arduino uno board via serial port, interfacing of switch with arduno uno board, reading switch status with arduino uno board serial port

Unit II

Programming internal peripherals of Arduino UNO : specifications of internal adc for arduino uno, programming internal adc for arduino uno, specifications of arduino uno board pwm, controlling arduino uno board pwm with adc

Unit III

Interfacing output devices : specifications of 7 – segment display, specifications of 16x2 lcd, introduction to liquid crystal display library

Unit IV

Interfacing actuators : introduction to dc motor and its application, introduction to dc motor driver circuit and its features, speed and direction control of dc motor with arduino uno board

Unit V

Interfacing of sensors : introduction to humidity and temperature sensor, interfacing dht11 sensor with arduino uno, introduction to ultrasonic sensor and interacting with lcd

Unit VI

Interfacing communicating module : blockchain and iot, introduction to bluetooth technology and its features, bluetooth module and its commands, interfacing bluetooth with arduino uno board for data transmission, controlling arduino uno gpio from phone, wearables, smart cities

List of Practicals / Experiments:

List of Practicals

- interfacing 7 – segment with arduino uno board
- interfacing lcd with arduino uno board
- controlling servo motor with arduino uno board
- controlling the speed of dc motor with variable resistor using pwm with arduino uno
- interfacing ultrasonic sensor with arduino uno with output on liquid-crystal display
- controlling the speed of dc motor with variable resistor using pulse with modulation
- intefacing rgb led to the arduino board
- intefacing photoresistor to the arduino board to turn an led on or off
- interface a ph sensor with arduino
- interfacing of wifi with arduino uno

Text Books:

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

References:

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