

EMBEDDED SYSTEMS & IoT Lab

Course Code	23S08353	Year	II	Semester	I
Course Category	Skill oriented Course (SOC)	Branch	ME	Course Type	Practical
Credits	2	L-T-P	0-1-2	Prerequisites	C Programming
Continuous Internal Evaluation:	30	Semester End Evaluation:	70	Total Marks:	100

Course Outcomes:

COs	Statements	Blooms Level
CO1	Establish Serial Communication link with Arduino	L4
CO2	Analyze basics of SPI interface.	L4
CO3	Understand the concept of M2M (machine to machine) with necessary protocols and get awareness in implementation of distance sensor.	L2
CO4	Realize the revolution of wireless modules, internet and sensor networks	L3
CO5	Make an effective report based on experiments	L2

Embedded Systems Experiments: (Any 5 experiments from the following)

1. Measure Analog signal from Temperature Sensor.
2. Generate PWM output.
3. Characteristics of vibration sensor and Pressure sensor
4. Wireless module interface-Bluetooth
5. Configuring and controlling of DC motor
6. Drive a given value on a 8 bit DAC consisting of SPI.
7. Drive Stepper motor using Analog GPIOs.
8. Drive mechanical tachometer

Internet of Things Experiments: (Any 5 experiments from the following)

1. Getting started with Raspberry Pi, Install Raspian on your SD card.
2. Study and Install IDE of Arduino and different types of Arduino.
3. Study and Implement Zigbee Protocol using Arduino / Raspberry Pi.
4. Calculate the distance using distance sensor Using Arduino.
5. Basic LED functionality Using Arduino.
6. Calculate temperature using temperature sensor Using Arduino.
7. Calculate the distance using distance sensor Using Node MCU.
8. Basic LED functionality Using Node MCU.

COMPONENTS/ BOARDS: 1. Arduino Board 2. Arduino Software IDE.

Text Books:

1. Arsheep Bahga & Vijay Madiseti, Internet of Things - A Hands-on Approach, 1/e, Orient Blackswan Private Limited - New Delhi, 2015.
2. Getting Started with Raspberry Pi, Matt Richardson & Shawn Wallace, O'Reilly (SPD), 2014.
3. Embedded System Design, Frank Vahid, Tony Givargis, John Wiley Publications, 2013.
4. Embedded Systems-Lyla B.Das-Pearson Publications, 2013.

Online Learning Sources

1. https://onlinecourses.nptel.ac.in/noc21_cs17/preview
2. https://onlinecourses.nptel.ac.in/noc20_ee98/preview
3. Virtual Labs - <http://vlabs.iitkgp.ac.in/rtes/>
4. Virtual Labs - <https://cse02-iiith.vlabs.ac.in/>
5. Virtual Labs - <https://iotvirtuallab.github.io/vlab/Experiments/index.html>