



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal - 500 043, Hyderabad, Telangana

COURSE CONTENT

INTERNET OF THINGS LABORATORY								
I Semester: EPS								
II Semester: EEE								
Course Code	Category	Hours / Week			Credits	Maximum Marks		
BPSD12	Core	L	T	P	C	CIA	SEE	Total
		-	-	4	2	30	70	100
Contact Classes: Nil		Tutorial Classes: Nil		Practical Classes: 36		Total Classes: 36		
Prerequisite: Power System Computational								

I. COURSE OVERVIEW:

The main objective of the course is to provide knowledge on internet of things and how important it is in present scenario. IoT is a connecting bridge between physical world and cyber world and Machine to Machine communication i.e. with automation as one subset. IoT refers to uniquely identifiable objects and their virtual representations in an Internet like structure. Measurement of various electrical quantities and functioning of induction motor in the case of over voltage, current is using arduino. Design a relay to protect the home appliances from over currents, under voltages and over voltages.

II. COURSES OBJECTIVES:

The students will try to learn:

- I. Understand the IoT using Arduino programming
- II. Explain the interfacing of data, I/O devices with Arduino UNO.
- III. Describe the digital protection schemes in power system relays.

IV. COURSE OUTCOMES:

After successful completion of the course students should be able to:

- CO1 List the different IOT applications and importance of IOT in present scenario.
- CO2 List the application of Arduino for Node MCU
- CO3 Know the different sensors available to measure the current and voltage
- CO4 Design the digital voltmeter and ammeter for both AC and DC circuits
- CO5 Design a digital frequency meter to measure the frequency in an AC circuit.
- CO6 Measure the power and energy consumption in a home using Arduino

V. LIST OF EXPERIMENTS:

Week1: ARDUINO BASED DIGITAL VOLTMETER, AMMETER

Design of digital voltmeter and ammeter using Arduino

Week2: ARDUINO BASED WATTMETER, ENERGY METER

Design of digital wattmeter and energy meter using Arduino

Week 3: CONROLLING RGB LED

Programming for Controlling RGB LED using Arduino and Wi-Fi module

Week 4: IOT TO CONTROL REMOTE LED

Programming for Internet of things with Android and Arduino. Build an Arduino based IoT to control a remote LED.

Week 5: INTERFACING BLUETOOTH MODULE

Programming for how to interface HC-05 Bluetooth module with Arduino UNO for control of small dc motor.

Week 6: INTERFACING TO TEMPERATURE SENSOR

Programming to Interface temperature sensor and monitoring the room temperature using IoT with Arduino Uno and display the digital value on LCD screen.

Week 7: INTERFACING IR SENSOR

Programming to Interface IR sensors and Bluetooth for detecting obstacle using Arduino with android Application

Week 8: INTERFACE TO MOTION AND GAS SENSOR

Programming to interface a motion sensor to use GPIO pins with a Raspberry Pi Programming to interface Gas sensor for detection and monitoring of harmful gases using Arduino and IoT

Week 9: SEND DATA FROM ARDUINO TO WEB PAGE

Programming for how to send data from Arduino to Webpage using Wi-Fi module

Week 10: DIGITAL PROTECTION OF THREE PHASE INDUCTION MOTOR

Studying the ON / OFF control strategies of small dc motor using IoT.
Develop program for economic load dispatch problem using lambda iterative method.

Week 11: DIGITAL PROTECTION OF TRANSFORMERS AND TRANSMISSION LINES

Study the protection schemes of three phase induction motor against over current and under voltage at remote location through IoT.

Week 12: OVER CURRENT RELAY

Design of over current relay in distribution system and displaying the tripping status of the relay through IoT.

VI. TEXTBOOKS:

- a. Samuel Greengard, K B Kanchandhani, "The Internet of Things", Tata Mc Graw Hill Publishing Company, 2nd Edition, 1998
- b. Cuno Pfister, "Getting started with Internet of Things", Khanna Publishers, 5th Edition, 2012.

VII. SOFTWARE AND HARDWARE REQUIREMENT OR STUDENTS

System Software: MATLAB and Arduino