

INTERNET OF THINGS LABORATORY

I Semester: EPS								
Course Code	Category	Hours / Week			Credit	Maximum Marks		
		L	T	P		C	CIA	SEE
BPSB10	Core	-	-	4	2	30	70	100
		Practical Classes: 48			Total Classes: 48			
Contact Classes: Nil Tutorial Classes: Nil								
I. COURSEOVERVIEW:								
<p>The goal of the lab to fundamental understands of IoT using Arduino programming for different electrical digital apparatus. It will also explain the interfacing of data, I/O devices with Arduino UNO like Bluetooth, sensors, Webpage etc. It will also cover the digital protection schemes. A goal of the lab is to develop test-beds and experimental facilities, demonstrating the effects of ubiquitous IoT technology.</p>								
II.COURSE OBJECTIVES:								
The course should enable the students to:								
<p>I. Understand the IoT using Arduino programming. II. Explain the interfacing of data, I/O devices with ArduinoUNO. III. Describe the digital protection schemes in power system relays.</p>								
III.COURSEOUTCOME:								
After successful completion of the course, students will be able to:								
CO 1	Understand the concept of Internet of Things for implementation of digital measuring devices.						Understand	
CO 2	Develop the Arduino programming for controlling lightning appliances.						Apply	
CO 3	Analyze the characteristics of bluetooth modules for controlling the performance of appliances.						Analyze	
CO 4	Analyze the features of various algorithms applicable for protection of Transformers and transmission lines.						Apply	
CO 5	Categorize the digital relying algorithms for protection of three phase induction motor.						Analyze	
CO 6	Analyze the various algorithms applicable for over current protection.						Analyze	
IV. LIST OF EXPERIMENTS								
Expt-1	DESIGN OF DIGITAL DC VOLTMETER AND AMMETER							
Design a Digital DC Voltmeter and Ammeter to measure the voltage and current in DC electrical circuits using Arduino and display the values in LCD display								
Expt. 2	DESIGN OF DIGITAL AC VOLTMETER AND AMMETER							
Design a Digital AC Voltmeter and Ammeter to measure the voltage and current in AC electrical circuits using Arduino and display the values in LCD display.								
Expt. 3	DIRECTION CONTROL OF THREE PHASE INDUCTION MOTOR							
Design a system to control the direction of three phase induction motor through IOT								
Expt. 4	DESIGN OF DIGITAL FREQUENCY METER							
Design a Digital frequency meter to measure the frequency in any AC electrical circuit using Arduino and display								

the values in LCD display	
Expt. 5	MEASUREMENT OF POWER AND ENERGY
Measure the power and energy in electrical circuit using Arduino and display the values in LCD display	
Expt. 6	MEASUREMENT OF PHASE SHIFT AND POWER FACTOR
Measure the phase shift and power factor in an electrical circuit for different loads using Arduino and display the value in LCD display.	
Expt. 7	IMPLEMENTATION OF OVER CURRENT RELAY
Design an over current relay for distribution system and displaying the tripping status of the relay in substation through IOT.	
Expt. 8	OVER/UNDER VOLTAGE PROTECTION OF HOME APPLIANCES
Design a system to protect home appliances from over and under voltages using Arduino.	
Expt. 9	PROTECTION OF THREE PHASE INDUCTION MOTOR
Design a system for protecting the three phase induction motor from over voltages, over currents, temperature and displaying the status of the motor at remote location using IOT	
Expt. 10	TRAFFIC SIGNAL CONTROL
Design a traffic control system using IOT.	
Expt. 11	RAILWAY GATE CONTROL BY STEPPER MOTOR
Design a Railway gate control system using stepper motor and observe the status of the gate in a nearby station using IOT.	
Expt. 12	DIRECTION AND SPEED CONTROL OF DC MOTOR
To control the speed and direction of a DC motor using Arduino and display the status of the motor at the remote location using IOT.	
Reference Books:	
<ol style="list-style-type: none"> 1. Mark torvalds, "Arduino Programming: Step-by-step guide to mastering arduino hardware and software (Arduino, Arduino projects, Arduinouno, Arduino starter kit, Arduino ide, Arduinoyun, Arduino mega, Arduinonano) Kindle 2nd Edition,2001. 2. Michael J Pont, "Embedded C", Pearson Education, 2ndEdition,2008. 	
Web References:	
<ol style="list-style-type: none"> 1. https://www.ee.iitkgp.ac.in 2. https://www.citchennai.edu.in 3. https://www.iare.ac.in 4. https://www.deltaww.com 	