

INTERNET OF THINGS LABORATORY

I Semester: ES																										
Course Code	Category	Hours / Week			Credits	Maximum Marks																				
		L	T	P	C	CIA	SEE	Total																		
BESB20	Core	-	-	4	2	30	70	100																		
Contact Classes: Nil	Tutorial Classes: Nil	Practical Classes: 36			Total Classes: 36																					
<p>I. COURSE OVERVIEW: This course outlines the design and implementation of embedded systems using suitable hardware(ARM and PSOC) and Keil Embedded C software tools.The instruction set, Embedded C programming for I/O and memory interfacing techniques are covered.The hands-on experience acquired by the student's during the course makes them to carry out processor/controller based projects and extend their knowledge on the latest trends and technologies in the field of embedded system.</p> <p>II. COURSE OBJECTIVES: The students will try to learn: I. The IoT using Arduino programming II. The interfacing of data I/O devices with Arduino. III. The design steps using Rasberry Pi.</p> <p>III. COURSE OUTCOMES: After successful completion of the course, students should be able to:</p> <table border="1"> <tr> <td>CO1</td> <td>Understand the concept of Internet of Things for implementation of digital measuring devices</td> <td>Understand</td> </tr> <tr> <td>CO2</td> <td>Develop the Arduino programming for controlling lightning appliances.</td> <td>Apply</td> </tr> <tr> <td>CO3</td> <td>Analyze the characteristics of bluetooth modules for controlling the performance of appliances.</td> <td>Analyze</td> </tr> <tr> <td>CO4</td> <td>Make use of direct and alternating type of electrical instruments using arduino</td> <td>Analyze</td> </tr> <tr> <td>CO5</td> <td>Categorize the protection schemes of induction motor against over current and under voltage.</td> <td>Analyze</td> </tr> <tr> <td>CO6</td> <td>Build a relay model for protection of home appliances from over and under voltages.</td> <td>Apply</td> </tr> </table>									CO1	Understand the concept of Internet of Things for implementation of digital measuring devices	Understand	CO2	Develop the Arduino programming for controlling lightning appliances.	Apply	CO3	Analyze the characteristics of bluetooth modules for controlling the performance of appliances.	Analyze	CO4	Make use of direct and alternating type of electrical instruments using arduino	Analyze	CO5	Categorize the protection schemes of induction motor against over current and under voltage.	Analyze	CO6	Build a relay model for protection of home appliances from over and under voltages.	Apply
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LIST OF EXPERIMENTS																										
Week-1	IOT WITH ARDUINO PROGRAMMING																									
Introduction to Internet of Things (IoT) using Arduino programming																										
Week-2	CONROLLING RGB LED																									
Programming for Controlling RGB LED using Arduino and Wi-Fi Module																										
Week-3	IOT TO CONTROL REMOTE LED																									

Programming for Internet of things with Android and Arduino. Build an Arduino IoT to control a remote LED	
Week-4	INTERFACING BLUETOOTH MODULE
Programming for how to interface HC-05 Bluetooth Module with Arduino UNO for various application	
Week-5	INTERFACING TO TEMPERATURE SENSOR
Programming to Interface Temperature sensor and Monitoring using IoT with Arduino Uno and display digital value on LCD.	
Week-6	INTERFACING IR SENSOR
Programming to Interface IR sensors and Blue tooth for detecting obstacle using Arduino with android Application.	
Week-7	TRACK LOCATION
Programming for Node MCU for track location without using GPS module	
Week-8	SEND DATA FROM ARDUINO TO WEB PAGE
Programming for how to send data from Arduino to Webpage using Wi-Fi module	
Week-9	IOT WITH RASBERRY PI
Introduction to Internet of things (IoT) by using a Raspberry Pi to connect devices.	
Week-10	SETUP WI-FI ON RASBERRY PI USING USB
Programming for how to Setup Wi-Fi on Raspberry Pi 2 using USB Dongle	
Week-11	INTERFACE TO MOTION SENSOR
Programming to interface a motion sensor to use GPIO pins with a Raspberry Pi.	
Week-12	INTERFACE TO GAS SENSOR
Programming to interface Gas sensor for detection and monitoring using Arduino and 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, Arduino uno, Arduino starter kit, Arduino ide, Arduino yun, Arduino mega, Arduino nano) Kindle Edition 2. Michael J. Pont, "Embedded C", Pearson Education, 2nd Edition, 2008. 	

SOFTWARE AND HARDWARE REQUIREMENTS FOR 18 STUDENTS

SOFTWARE:

System Software: Microsoft windows/ Linux
Programming Languages: Python and Embedded C.

HARDWARE:

18 numbers of Intel Desktop Computers with 2 GB RAM
Dot matrix Printers: 02