INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal - 500 043, Hyderabad, Telangana

COURSE CONTENT

INTERNET OF THINGS (IoT) APPLICATIONS LABORATORY								
II Semester: ES								
Course Code	**Category**	**Hours / Week**			**Credits**	**Maximum Marks**		
		L	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
BESE23	Core	-	-	4	2	40	60	100
Contact Classes: Nil	**Tutorial Classes: Nil**	**Practical Classes: 45**				**Total Classes: 45**		
Prerequisite: Embedded C.								

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.

II. COURSES 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 Raspberry Pi.

III. COURSE OUTCOMES:

At the end of the course students should be able to:

CO1	Understand the concept of Internet of Things for implementation of digital measuring devices
CO2	Develop the Arduino programming for controlling lightning appliances.
CO3	Analyze the characteristics of Bluetooth modules for controlling the performance of appliances.
CO4	Make use of direct and alternating type of electrical instruments using Arduino
CO5	Categorize the protection schemes of induction motor against over current and under voltage.
CO6	Build a relay model for protection of home appliances from over and under voltages.

IV. 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: INTERFCAING 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.

WEEK-13: INTERFACE TO SOIL MOSITURE SENSOR WITH NODE

Programming to interface soil moisture sensor with a node and irrigates plant automatically.

WEEK-14: INTERFACE TO SOLENOID VALVE WITH NODE

Programming to interface solenoid valve actuator for real time applications.

V. REFERENCE BOOKS:

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, 2nd Edition, 2009.
2. Michael J. Pont, “Embedded C”, Pearson Education, 2nd Edition, 2008.

VI. MATERIALS ONLINE

1. Course Template
2. Laboratory
3. Manual