|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **BEE01T1004** | **Embedded Technology and IoT** | **L** | **T** | **P** | **C** |
| Total Contact Hours | 1 | 0 | 2 | 2 |
| Prerequisite – | | | | |
| Department:-Dept. of Electronics and Communication Engineering. | | | | |
| **COURSE OBJECTIVES:**   * + To provide the awareness of major embedded devices and interfacing devices   + To understand key technologies in Internet of Things.   + To analyze, design or develop parts of an Internet of Things solution for IoT applications. | | | | | |

# UNIT I INTODUCTION TO EMBEDDED SYSTEM

Basic components of Embedded system, Programming Language Classification of Embedded system, Advantage & Disadvantage, Difference between Microprocessor & Microcontroller, Classification based on architecture, Memory Classification, Description of RAM, Description of CPU Registers, Introduction to Embedded C, Difference between C & Embedded C.

# UNIT II CONTROL STATEMENTS AND FUNCTIONS

Decision making with if statement, If…. else statement, Switch statement, GOTO statement, The While and Do – While statements, For statement, Why Functions, Types of Functions, Multi-functional program, Return values & their types

*UNIT III* ***EMBEDDED SOFTWARE AND HARDWARE INTERFACING***

Kiel Compiler, Proteus, Interfacing of LED, Seven segment display, , LCD, Switches, Keyboard, Serial Communication, Sensors

# UNIT IV  INTRODUCTION TO IoT

Internet of Things - Physical Design- Logical Design- IoT Enabling Technologies - IoT Levels & Deployment Templates

**At least SIX experiments needs to be performed**

**List of Experiments**

* Getting started with the Arduino IDE: Serial Communication between Arduino board and PC:-character send and received, Read and display voltage
* Experiments using single and multiple LEDs: Experiments on digital input and digital output on Arduino Uno board and using LED and Buzzer
* Hands on experiments on Interfacing of the LDR,LCD: Experiment on LCD display:-Print numbers, Name, Time etc.
* Experiments using Seven Segment display.
* Experiments using Temperature , IR, Finger print sensors.
* Experiments with Raspberry Pi using LED.
* Experiments on the applications of Buzzer, potentiometer.
* Experiments on Interfacing with Bluetooth devices.
* Design and development of Arduino/Raspberry Pi based system for defined application/ projects.
* Getting started with the Arduino IDE: Serial Communication between Arduino board and PC:-character send and received, Read and display voltage .
* Experiments using single and multiple LEDs: Experiments on digital input and digital output on Arduino Uno board and using LED and Buzzer.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Course Outcome (COs)** | | | | | | | | | | | | | | | | | |
| CO1 | | Understand the concept of embedded system, microcontroller, different components of microcontroller and their interactions. | | | | | | | | | | | | | | | |
| CO2 | | Recognize and analyze given embedded system design and its performance. | | | | | | | | | | | | | | | |
| CO3 | | Identify the programming environment to develop embedded solutions. | | | | | | | | | | | | | | | |
| CO4 | | Demonstrate application based competencies in Embedded Programming | | | | | | | | | | | | | | | |
| CO5 | | Identify and adopt knowledge of the terminology, requirements and constraints for IoT system development. | | | | | | | | | | | | | | | |
| CO6 | | Demonstrate IoT system for smaller applications | | | | | | | | | | | | | | | |
| Mapping of Course Outcomes with Program outcomes (POs)  (1/2/3 indicates strength of correlation) 3-High, 2-Medium, 1-Low | | | | | | | | | | | | | | | | | |
| 1 | COs/POs | | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PS  O1 | PS  O2 | PS  O3 |
| 2 | CO1 | | 3 | 2 | 3 | 3 | 3 |  |  |  |  |  |  |  | 3 |  |  |
| CO2 | | 2 | 3 | 3 | 2 | 2 |  |  |  |  |  |  |  |
| CO3 | | 2 | 3 | 2 | 2 | 3 |  |  |  |  |  |  |  |
| CO4 | | 2 | 3 |  |  | 2 |  |  |  |  |  |  |  |
| CO5 | | 3 | 2 |  |  | 3 |  |  |  |  |  |  |  |
| CO6 | | 2 | 3 | 3 |  | 2 |  |  |  |  |  |  |  |
| 3 | Category | |  | | | | | | | | | | | | | | |
| 4 | Approval | |  | | | | | | | | | | | | | | |