| BCSE312P | Programming for IoT Boards Lab | L | T | P | C |
|---|---|---|---|---|---|
| | | 0 | 0 | 2 | 1 |
| **Pre-requisite** | **NIL** | **Syllabus version** | | | |
| | | 1.0 | | | |

**Course Objectives**

1.To introduce Internet of Things (IoT) environment and its technologies for designing smart systems
2.To explore open-source computer hardware/software platform, development and debugging environment, programming constructs and necessary libraries
3.To learn embedded programming constructs and real time systems

**Course Outcome**

At the end of this course, student will be able to:
1. Use open-source hardware prototyping platform and peripherals for building digital devices and interactive objects that can sense and control the physical world.
2. Program SBC for practical IoT devices using Python and explore protocols, data conversion process, API's and expansion boards for real world interaction.

**Indicative Experiments**

| | |
|---|---|
| 1. | Introduction to IoT Development Kit and Development Environment |
| 2. | Internet Controlled LEDs |
| 3. | Temperature Logger |
| 4. | Home Automation |
| 5. | Soil Moisture Sensor |
| 6. | Light Color Control |
| 7. | Home Security System |
| 8. | Parking Sensor |
| 9. | Motor Control |
| 10. | Water Level Control |
| 11. | Street Light Control |
| | Total Laboratory Hours **30 hours** |

**Text Book(s)**

| | |
|---|---|
| 1. | Yamanoor, Sai, and Srihari Yamanoor. Python Programming with Raspberry Pi, 2017,1st edition, Packt Publishing Ltd,UK. |
| 2. | Donald Norris, The Internet of Things: Do-It-Yourself Projects with Arduino, Raspberry Pi, and BeagleBone Black, 2015,1st edition,McGraw Hill Education, USA. |

**Reference Books**

| | |
|---|---|
| 1. | Schwartz, Marco. Home Automation with Arduino: Automate your Home using Open-Source Hardware. 2013, 1st Edition, CreateSpace Independent Publishing, USA. |
| 2. | Kooijman, Matthijs. Building Wireless Sensor Networks Using Arduino, 2015, 1st edition, Packt Publishing Ltd, UK. |

| | | | |
|---|---|---|---|
| Mode of Evaluation: CAT / Mid-Term Lab/ FAT | | | |
| Recommended by Board of Studies | 04-03-2022 | | |
| Approved by Academic Council | No. 65 | Date | 17-03-2022 |