COURSE MODULE FOR THE AY- 2025-26 (EVEN Sem)

Course Syllabi with CO's

Department: Electronics and Communication Engineering

Course Code	Course Title	Core/Elective	Prerequisite	Contact Hours			Total hrs/sessions
				L	T	P	
BEC657C	IoT (Internet of Things) Lab	Elective	Basic of Microcontroller, Basics of Programming	-	-	2	

Objectives	**This course will enable students to:**
	• To impart necessary and practical knowledge of components of the Internet of Things
	• To develop skills required to build real-life IoT-based projects.

Laboratory Experiments

1. (i) To interface LED/Buzzer with Arduino /Raspberry Pi and write a program to 'turn ON' LED for 1 sec after every 2 seconds.
   (ii) To interface the Push button/Digital sensor (IR/LDR) with Arduino /Raspberry Pi and write a program to 'turn ON' LED when a push button is pressed or at sensor detection.
2. (i) To interface the DHT11 sensor with Arduino /Raspberry Pi and write a program to print temperature and humidity readings.
   (ii) To interface OLED with Arduino /Raspberry Pi and write a program to print its temperature and humidity readings.
3. To interface the motor using a relay with Arduino /Raspberry Pi and write a program to 'turn ON' the motor when a push button is pressed.
4. (i) Write an Arduino/Raspberry Pi program to interface the Soil Moisture Sensor.
   (ii) Write an Arduino/Raspberry Pi program to interface the LDR/Photo Sensor.
5. Write a program to interface an Ultrasonic Sensor with Arduino /Raspberry Pi.
6. Write a program on Arduino/Raspberry Pi to upload temperature and humidity data to thingspeak cloud.
7. Write a program on Arduino/Raspberry Pi to retrieve temperature and humidity data from thingspeak cloud.
8. Write a program to interface LED using Telegram App.
9. Write a program on Arduino/Raspberry Pi to publish temperature data to the MQTT broker.
10. Write a program to create a UDP server on Arduino/Raspberry Pi and respond with humidity data to the UDP client when requested.
11. Write a program to create a TCP server on Arduino /Raspberry Pi and respond with humidity data to the TCP client when requested.
12. Write a program on Arduino / Raspberry Pi to subscribe to the MQTT broker for temperature data and print it.

Course Outcomes	At the end of the course, the student will be able to: 1. Explain the Internet of Things and its hardware and software components. 2. Interface I/O devices, sensors & communication modules. 3. Remotely monitor data and control devices. 4. Develop real-life IoT-based projects.

Continuous Internal Evaluation (CIE):
CIE marks for the practical course are 50 Marks.
The split-up of CIE marks for record/ journal and test are in the ratio 60:40.

- Each experiment will be evaluated for conduction with an observation sheet and record write-up. Rubrics for the evaluation of the journal/write-up for hardware/software experiments are designed by the faculty who is handling the laboratory session and are made known to students at the beginning of the practical session.
- The record should contain all the specified experiments in the syllabus and each experiment write-up will be evaluated for 10 marks.
- The total marks scored by the students are scaled down to 30 marks (60% of maximum marks).
- Weightage is to be given for neatness and submission of record/write-up on time.
- The department shall conduct a test of 100 marks after the completion of all the experiments listed in the syllabus.
- In a test, test write-up, conduction of experiment, acceptable result, and procedural knowledge will carry a weightage of 60% and the rest 40% for viva-voce.
- The suitable rubrics can be designed to evaluate each student's performance and learning ability.
- The marks scored shall be scaled down to 20 marks (40% of the maximum marks).

The Sum of scaled-down marks scored in the report write-up/journal and marks of a test is the total CIE marks scored by the student.

Suggested Learning Resources:

1. Vijay Madisetti, Arshdeep Bahga, Internet of Things. "A Hands-on Approach", University Press
2. Dr. SRN Reddy, Rachit Thukral, and Manasi Mishra, "Introduction to Internet of Things: A Practical Approach", ETI Labs
3. Pethuru Raj and Anupama C Raman, "The Internet of Things: Enabling Technologies, Platforms, and Use Cases", CRC Press
4. Jeeva Jose, "Internet of Things", Khanna Publishing House, Delhi
5. Adrian McEwen, "Designing the Internet of Things", Wiley
6. Raj Kamal, "Internet of Things: Architecture and Design", McGraw Hill

The Correlation of Course Outcomes (CO's) and Program Outcomes (PO's)

Course Code:	BECL305	Course Title: Analog and Digital Systems Design Lab											
List of Course Outcomes	Program Outcomes												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO-1	3	3	1	1	2	1	–	2	2	–	3	3	2
CO-2	3	3	2	2	3	1	–	2	2	–	3	3	2
CO-3	3	3	3	2	3	1	–	2	2	–	3	3	2
CO-4	3	3	3	3	3	1	–	2	2	2	3	3	2

Note: 3=Strong Contribution 2=Average Contribution 1=Weak Contribution