Semester: I/II			
Course Title	Introduction to Internet of Things (IoT)	**CIE Marks**	50
Course Code	BECETC105/205H	**SEE Marks**	50
Course Type	Theory	**Total Marks**	100
Course Category	ETC	**SEE Duration**	03 hrs
Hours Per Week	3L : 0T : 0P	**SEE Type**	Written
Total Hours	40 hrs	**Credits**	03

Course Learning Objectives
This course will enable the students to
• Understand about the fundamentals of Internet of Things and its building blocks along with their characteristics.
• Understand the recent application domains of IoT in everyday life.
• Gain insights about the current trends of Associated IoT technologies and IoT Analytics.
Pre-Requisites
• Computers and the Internet.

Module-1	**(8 hrs)**
Basics of Networking: Introduction, Network Types, Layered network models (**Text Book 1:** 1.1 to 1.3) **Emergence of IoT:** Introduction, Evolution of IoT, Enabling IoT and the Complex Interdependence of Technologies, IoT Networking Components (**Text Book 1**: 4.1 to 4.4)	
Module-2	**(8 hrs)**
IoT Sensing and Actuation: Introduction, Sensors, Sensor Characteristics, Sensorial Deviations, Sensing Types, Sensing Considerations, Actuators, Actuator Types, Actuator Characteristics. (**Text Book 1**:5.1 to 5.9)	
Module-3	**(8 hrs)**
IoT Processing Topologies and Types: Data Format, Importance of Processing in IoT, Processing Topologies, IoT Device Design and Selection Considerations, Processing Offloading. (**Text Book 1**: 6.1 to 6.5)	
Module-4	**(8 hrs)**
Associated IoT Technologies: Cloud Computing: Introduction, Virtualization, Cloud Models, Service-Level Agreement in Cloud Computing, Cloud Implementation, Sensor-Cloud: Sensors-as-a-Service. (**Text Book 1**: 10.1 to 10.6) **IoT Case Studies:** Agricultural IoT – Introduction and Case Studies. (**Text Book 1**: 12.1-12.2)	
Module-5	**(8 hrs)**
IoT Case Studies and Future Trends: Vehicular IoT – Introduction (Text **Book 1**: 13.1) Healthcare IoT – Introduction, Case Studies (**Text Book 1**: 14.1-14.2) IoT Analytics – Introduction (**Text Book 1**: 17.1)	

Text Book:	
1.	"Introduction to IoT", Sudip Misra, Anandarup Mukherjee, Arijit Roy, Cambridge University Press 2021.
Reference Books:	
1.	"Introduction to Industrial Internet of Things and Industry 4.0" , S. Misra, C. Roy, and A. Mukherjee, CRC Press, 2020.
2.	"Internet of Things (A Hands-on-Approach)", Vijay Madisetti and Arshdeep Bahga, 1st Edition, VPT, 2014.
3.	"Rethinking the Internet of Things: A Scalable Approach to Connecting Everything", Francis daCosta, 1st Edition, Apress Publications, 2013.

Course Outcome Statements: After the successful completion of the course, the student will be able to	
CO1	Explain the Networking Fundamentals and IoT foundation.
CO2	Explain the appropriate solutions to optimize performance of specific IoT applications.
CO3	Analyze IoT technologies and future trends.
CO4	Use the concepts of IoT to demonstrate Sensor based applications.

Course Articulation Matrix

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	-	-	-	-	-	-	-	-	-	-	-
CO2	2	-	-	-	-	-	-	-	-	-	-	-
CO3	2	2	-	-	-	-	-	-	-	-	-	-
CO4	2	2	-	-	2	-	-	-	2	2	-	2
Avg.	**2**	**2**	-	-	**2**	-	-	-	**2**	**2**	-	**2**

3: High, 2: Medium, 1: Low

Suggested Activity Based Assessment (ABA) Methods

Demonstrate Arduino interfacing with

- LED and Buzzer
- LDR
- Temperature – humidity sensor
- Ultrasonic sensor