

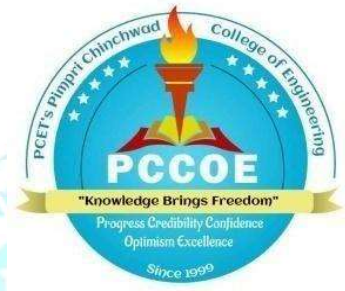
Pimpri Chinchwad Education Trust's

PIMPRI CHINCHWAD COLLEGE OF ENGINEERING

SECTOR NO. 26, PRADHIKARAN, NIGDI, PUNE 411044

An Autonomous Institute Approved by AICTE and Affiliated to SPPU, Pune

**DEPARTMENT OF ELECTRONICS AND TELECOMMUNICATION
ENGINEERING**



Curriculum Structure and Syllabus

Minors in

Internet of Things (IoT)

(Regulations 2023)



Effective from Academic Year 2025-26

(Updated with Minor Changes)

Institute Vision

To be one of the top 100 Engineering Institutes of India in coming five years by offering exemplarily Ethical, Sustainable and Value Added Quality Education through a matching ecosystem for building successful careers.

Institute Mission

1. Serving the needs of the society at large through establishment of a state-of-art Engineering Institute.
2. Imparting right Attitude, Skills, Knowledge for self-sustenance through Quality Education.
3. Creating globally competent and Sensible engineers, researchers and entrepreneurs with an ability to think and act independently in demanding situations.

EOMS Policy

“We at PCCOE are committed to offer exemplarily Ethical, Sustainable and Value Added Quality Education to satisfy the applicable requirements, needs and expectations of the Students and Stakeholders.

"Knowledge Brings Freedom"


We shall strive for technical development of students by creating globally competent and sensible engineers, researchers and entrepreneurs through Quality Education.

We are committed for Institute’s social responsibilities and managing Intellectual property.

We shall achieve this by establishing and strengthening state-of-the-art Engineering Institute through continual improvement in effective implementation of Educational Organizations Management Systems (EOMS).”

Course Approval Summary

Board of Studies - Department of E&TC Engineering

Sr. No.	Name of the Course	Course Code Scheme A/B	Page number	Signature and stamp of BoS chairman
1	Fundamental of Internet of Things	BET25MN11/ BET25MN11	9	 Chairman BoS, Electronics & Telecommunication Engineering PCET's, Pimpri Chinchwad College of Engineering Sector No. 26, Pradhikaran, Nigdi, Pune-44
2	Fundamentals of Internet of Things Lab	BET25MN12/ BET25MN12	11	
3	IoT systems design	BET26MN11/ BET26MN11	12	
4	IoT systems design Lab	BET26MN12/ BET26MN12	14	
5	Technologies Enabling IoT	BET27MN11/ BET28MN12	15	
6	Seminar	BET27MN12/ BET28MN13	17	
7	Project	BET28MN11/ BET27MN13	18	

Approved by Academic Council:

"Knowledge Brings Freedom"


Chairman

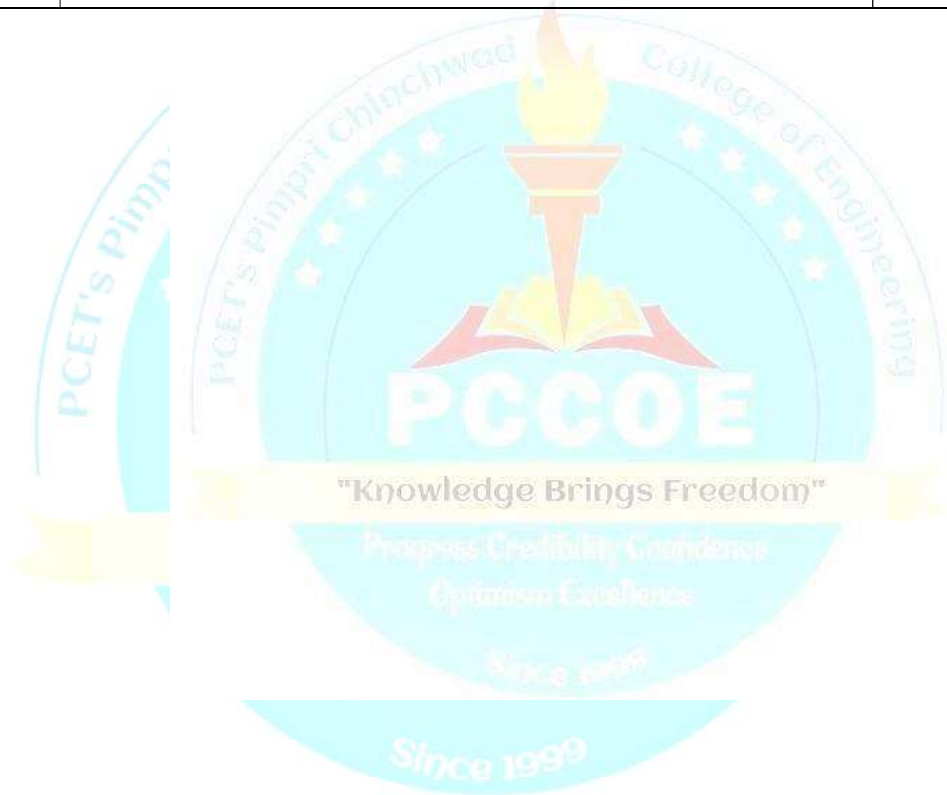
Academic Council

PCET's, Pimpri Chinchwad College of Engineering
Sector No. 26, Pradhikaran, Nigdi, Pune-44

Chairman, Academic Council
Pimpri Chinchwad College of Engineering, Pune

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5	Vision and Mission of Department	19



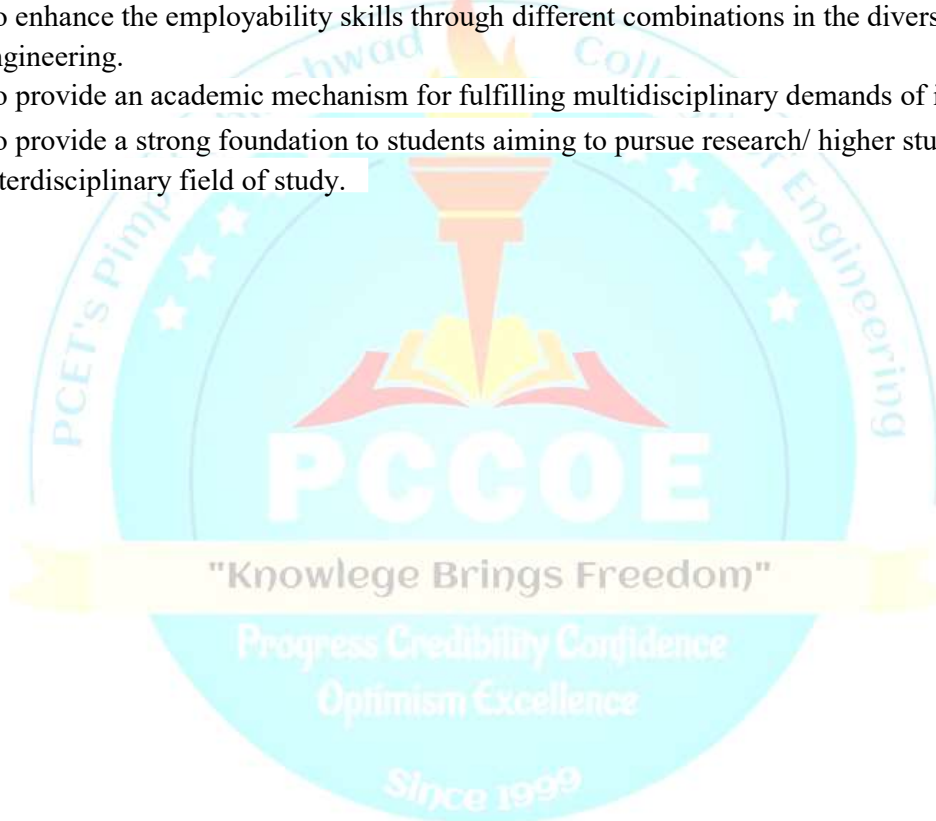
Preface

Looking at Global Scenario to enhance the employability skills and impart deep knowledge in emerging/ multidisciplinary areas, an additional avenue is provided to passionate learners through the Minors and Honors Degree Scheme in academic structure.

For **Minors degree** program, student has to earn additional 20 credits in multidisciplinary areas of other domains.

Objectives of Minors Degree

- To impart knowledge in multidisciplinary areas.
- To provide effective yet flexible options for students to achieve basic to intermediate level competence in the multidisciplinary area.
- To enhance the employability skills through different combinations in the diverse fields of engineering.
- To provide an academic mechanism for fulfilling multidisciplinary demands of industries.
- To provide a strong foundation to students aiming to pursue research/ higher studies in an interdisciplinary field of study.



Internet of Things

The Internet of Things in Engineering is embedded with sensors, software, and other technologies for the purpose of connecting and exchanging data with other devices and systems over the internet together. IoT has a huge impact on the field of civil and mechanical engineering such as Preventive Maintenance Programs, Real-Time Construction Management Solution, Workers' safety, Ease of governing the machines, increased communication ,Field testing etc.

Objectives of Minor program:

1. To familiarize the students with the fundamentals of hardware and software required for designing an IoT system.
2. To familiarize the students with the technologies those contribute in building an IoT application.
3. The promise of the Industrial Internet of Things (IIoT) brings many new business prospects.

Outcomes of Minor program:

On the completion of the course, students will be able to

1. Develop embedded applications using microcontrollers, sensors and actuators.
2. Choose the appropriate protocol, cloud service and data handling methods for an IoT application.
3. Develop skills in identifying areas in mechanical and civil where IoT can be deployed for making the application smart and in turn contributing to the overall development of the particular sector.
4. Examine technological developments that will likely shape the industrial Automation in the future.

"Knowledge Brings Freedom"

Progress Credibility Confidence
Optimism Excellence

Since 1999

Curriculum Structure

Progress Creativity Confidence
Optimism Excellence

Since 1999

Curriculum Structure Scheme-A

Sem-ester	Course Code	Course Name	Teaching Scheme					Evaluation Scheme						
			L	P	T	Hrs	CR	FA1	FA2	SA	TW	PR	OR	Total
V	BET25MN11	Fundamental of Internet of Things	4	-	-	4	4	20	20	60	-	-	-	100
	BET25MN12	Fundamentals of Internet of Things Lab	-	2	-	2	1	-	-	-	25	-	25	50
VI	BET26MN11	IoT systems design	4	-	-	4	4	20	20	60	-	-	-	100
	BET26MN12	IoT systems design Lab	-	2	-	2	1	-	-	-	25	-	25	50
VII	BET27MN11	Technologies Enabling IoT	4	-	-	4	4	20	20	60	-	-	-	100
	BET27MN12	Seminar	-	4	-	4	2	-	-	-	-	-	50	50
VIII	BET28MN11	Project	-	8	-	8	4	-	-	-	100	-	50	150
Total			12	16		28	20	-	-	-	-	-	-	600

Curriculum Structure Scheme-B

Sem-ester	Course Code	Course Name	Teaching Scheme					Evaluation Scheme						
			L	P	T	Hrs	CR	FA1	FA2	SA	TW	PR	OR	Total
V	BET25MN11	Fundamental of Internet of Things	4	-	-	4	4	20	20	60	-	-	-	100
	BET25MN12	Fundamentals of Internet of Things Lab	-	2	-	2	1	-	-	-	25	-	25	50
VI	BET26MN11	IoT systems design	4	-	-	4	4	20	20	60	-	-	-	100
	BET26MN12	IoT systems design Lab	-	2	-	2	1	-	-	-	25	-	25	50
VII	BET27MN13	Project	-	8	-	8	4	-	-	-	100	-	50	150
VIII	BET28MN12	Technologies Enabling IoT	4	-	-	4	4	20	20	60	-	-	-	100
	BET28MN13	Seminar	-	4	-	4	2	-	-	-	-	-	50	50
Total			12	16		28	20	-	-	-	-	-	-	600

Abbreviations:

L-Lecture, P- Practical, T-Tutorial, H- Hours, FA-Formative Assessment ,SA- Summative Assessment , TW- Termwork, OR – Oral, CR- Credits



Course Syllabus

Since 1999

Program: B. Tech. (E&TC)-Minors in Internet of Things				Semester: V			
Course Name :		Fundamentals of Internet of Things		Course Code :BET25MN11			
Teaching Scheme (Hrs./Week)				Evaluation Scheme and Marks			
Credit	Lecture	Practical	Tutorial	FA		SA	Total
				FA1	FA2		
4	4	-	-	20	20	60	100
Prior Knowledge of							
<ul style="list-style-type: none"> Basic Electronics Engineering Is essential 							
Course Objectives:							
<ol style="list-style-type: none"> To study the fundamentals about IoT To study various protocols used in the Internet of Things environment To study the design methodology and different IoT hardware platforms. To study about various IoT case studies and industrial applications 							
Course Outcomes:							
On the completion of the course, students will be able to,							
<ol style="list-style-type: none"> Understand the basic architecture of Internet of Things based Devices Illustrate wireless communication systems. Identify actuators and sensor technologies for sensing real world entities. Apply design methodology and cloud platforms involved in IoT Deploy an IoT application and connect to the cloud. Compare IoT Applications in Industrial & real world. 							
Detailed Syllabus:							
Unit	Description						Duration (Hrs.)
1.	Introduction to IoT :- Introduction to Internet of Things (IoT), Functional Characteristics, Recent Trends in the Adoption of IoT, Role of cloud in IoT, Societal Benefits of IoT:- Health Care, Machine to Machine (M2M), Smart Transportation, Smart Living, Smart Cities, Smart Grid						11
2.	Communication Principles:- RFID, ZigBEE, Bluetooth, Internet Communication- IP Addresses - MAC Addresses , IEEE 802 Family of Protocols , I/O interfaces Software Components						9
3.	Sensing and Actuation:- Definition of Sensor, Sensor features, Resolution, Classes, Different types of sensors, Actuator, Different types of Actuators, purpose of Sensors and Actuators in IoT						11
4.	IoT Application Development:- Frame work for IoT Applications-Implementation of Device integration, Data acquisition and Integration, Device data storage on cloud/local server, Authentication, authorization of Devices						9
5.	Cloud computation :- Evolution of Cloud Computation, Commercial clouds and their features, open source IoT platforms, cloud dashboards, Interfacing and data logging with cloud: Blync, Thing speak, platforms.						11
6.	IoT Case Studies:- IoT Case studies based on industrial Automation, Transportation, Smart cities, smart supply chain, Remote site monitoring .						9
	Total Hrs.						60
Textbooks:							
<ol style="list-style-type: none"> Adrian Mcewen, Hakin Cassimally, "Designing The Internet of Things", First Edition, Wiley, 2014. Keysight Technologies, "The Internet of Things: Enabling Technologies and Solutions for Design and Test", Application Note, 2016. Vijay Madiseti, Arshdeep Bahga, "Internet of Things A Hands-On- Approach", 2014, ISBN:978 0996025515 							

Reference Books:

1. Raj Kamal ,“ Internet of Things: Architecture and Design”, McGraw Hill.2nd edition June 2022
2. Pethuru Raj, Anupama C. Raman ,” The Internet of Things Enabling Technologies, Platforms, and Use Cases”, Taylor and Francis group. February 2017

Peter Waher, “Mastering Internet of Things: Design and create your own IoT applications using Raspberry Pi 3”, First Edition, Packt Publishing, 2018.



Program: B. Tech. (E&TC)-Minors in Internet of Things				Semester:V			
Course: Fundamentals of Internet of Things Lab				Code: BET25MN12			
Teaching Scheme (Hrs./Week)				Evaluation Scheme and Marks			
Credit	Theory	Practical	Tutorial	TW	OR	PR	Total
1	-	2	-	25	25	-	50
Prior knowledge of: Basic electronics and basic of programming is essential.							
Objectives: The main objective of this course is to <ol style="list-style-type: none"> To study fundamental concepts of IoT To study roles of sensors in IoT To correlate the connection of smart objects and IoT access technologies. 							
Outcomes: At the end of Laboratory work, the students will be able to: <ol style="list-style-type: none"> To understand the various concepts, terminologies and architecture of IoT To understand use of sensors and actuators for design of IoT To understand design methodology and hardware platforms. 							
General Guidelines: Any Six Experiments is to be performed.							
Detailed Syllabus:							
Expt. No.	List of Experiments						
1	Basics of Internet of Things: Sensors, Actuators, IoT architecture and Gateway						
2	IoT Networking: Connectivity technologies, Protocols and Interoperability in IoT.						
3	LED blinking with Arduino Uno.						
4	IoT sensors interface with Arduino (Temperature/Light sensors)						
5	Integration of Actuators with nodeMCU (Servo motor/Relay).						
6	Capture Image with node MCU.						
7	To interface LCD and real time clock with Arduino.						
8	Upload/download sensor data on cloud and server.						
Virtual Lab Links:- <ol style="list-style-type: none"> https://docs.simuli.co/getting-started/arduino/arduino-ide-and-vlab https://docs.simuli.co/getting-started/raspberry-pi/setting-up-iotify-virtual-lab 							

Program: B. Tech. (E&TC)-Minors in IoT				Semester :VI			
Course Name: IoT systems design				Course code :BET26MN11			
Teaching Scheme (Hrs./Week)				Evaluation Scheme and Marks			
Credit	Lecture	Practical	Tutorial	FA		SA	Total
				FA1	FA2		
4	4	-	-	20	20	60	100
Pre-requisites: Fundamental knowledge of Sensors, Actuators & networking.							
Course Objectives:							
<ol style="list-style-type: none"> 1. Describe the basic concepts of IoT. 2. Explain various IoT protocols required for implementing IoT applications. 3. Explain the key requirements for implementing IoT with Arduino Uno and Raspberry Pi development boards. 4. Describe the Node-RED tool for designing the IoT applications in Raspberry PI. 							
Course Outcomes:							
On the completion of the course, students will be able to,							
<ol style="list-style-type: none"> 1. Understand the fundamentals IoT. 2. Gain the knowledge of various IoT protocols. 3. Deploy Arduino uno for designing the IoT applications. 4. Deploy Raspberry Pi for designing the IoT applications. 5. Develop an IoT system with Node-RED tool using Rasperry Pi 6. Develop the logic for Python Programming. 							
Detailed Syllabus:							
Unit	Description						Duration (Hrs.)
1	IoT-An Architectural Overview – Building architecture, Main design principles and needed capabilities, An IoT architecture outline, standards considerations. M2M and IoT Technology .						11
2	IoT Protocols: Internet and Web layering, Introduction to wired and wireless communication technologies for IoT, Edge connectivity, IoT protocols - MQTT, MQTT-SN, Constrained Application Protocol (CoAP), STOMP, AMQP, Comparison of protocols,IPv4 and IPv6						9
3	Implementing IoT with Arduino: Introduction to Arduino Platforms, Arduino Uno architecture, IDE setup, importing Arduino boards in Arduino IDE tool, Installation of Arduino libraries, Basics of Embedded C Programming, Interfacing of Sensors and Actuators with Arduino Uno.						11
4	Implementing IoT with Raspberry Pi (Rpi): Basic functionality of RPi board, setting up the board by installing OS, first boot and basic configuration of Rpi, Basic Linux Commands, Accessing RPi remotely using networking tools, RPi GPIO pins						9
5	Getting started with Node-RED tool on Rpi: Prerequisite for Node-RED, Installing and upgrading Node-RED, Running Node-RED app locally and as a service on network, auto-start on boot, opening the editor, installation of various libraries for Node-RED, adding node, add debug node, wire the nodes, deploy the flow.						11
6	Python Programming :- Installation of python , Numbers and Math in python, Variables and Inputs, built –in modules ,functions, strings, python lists, python slicing, Save and run python files						9
Total Hrs.-60							

Textbooks:

1. Programming the Raspberry Pi: Getting Started with Python, Simon Monk, 2nd Edition, ISBN: 978-1259587405, Tata McGraw Hill Publication. 2012
2. Pethuru Raj and Anupama C. Raman, "The Internet of Things: Enabling Technologies, Platforms, and Use Cases", CRC Press,2017
3. Arduino for Dummies, John Nussey, 2nd Edition, ISBN: 978-1119489542, For Dummies Publishing,2018

Reference Books:

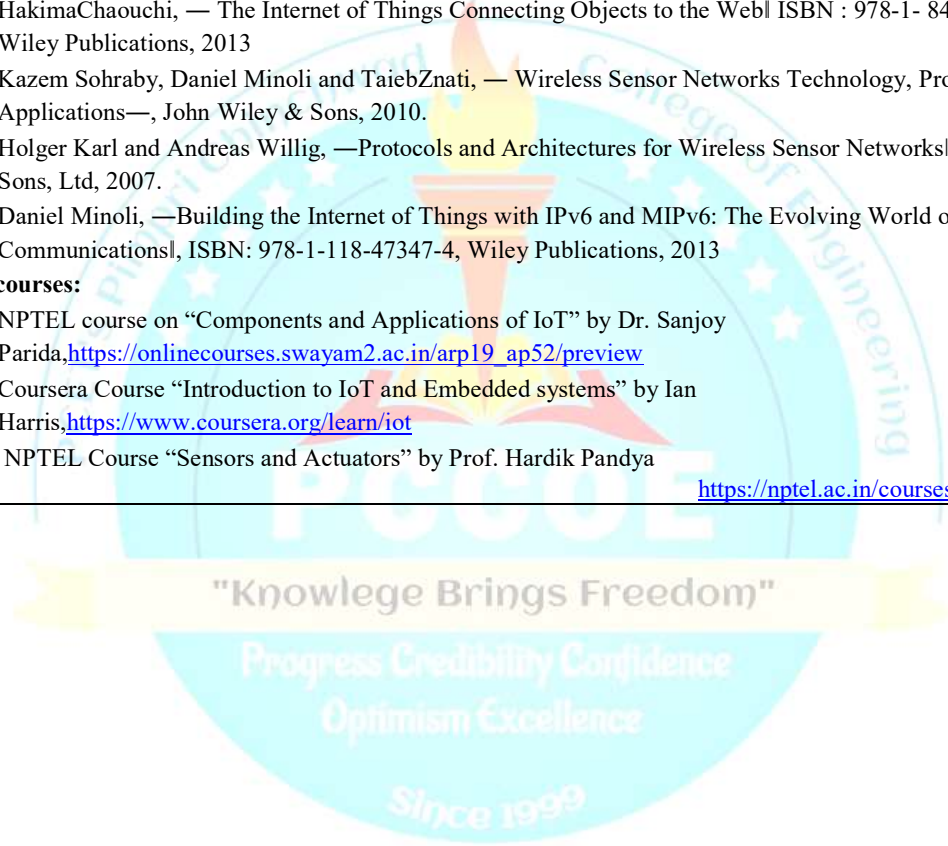
1. Daniel Minoli, "Building the Internet of Things with IPv6 and MIPv6: The Evolving World of M2M Communications", ISBN: 978-1-118-47347-4, Wiley Publications,2013
2. Programming Arduino: Getting started with sketches, 2nd Edition, Simon Monk, ISBN: 978-1259641633, Tata McGraw Hill Publication.
3. Exploring Raspberry Pi: Interfacing to the real world with Embedded Linux, Derex Molly, 1st Edition, ISBN: 978-1119188681, Wiley Publication,2016
4. Arduino Programming in 24 hours, Richard Blum, 1st Edition, ISBN: 978-0672337123, Sams Tech Yourself Publishing,2014



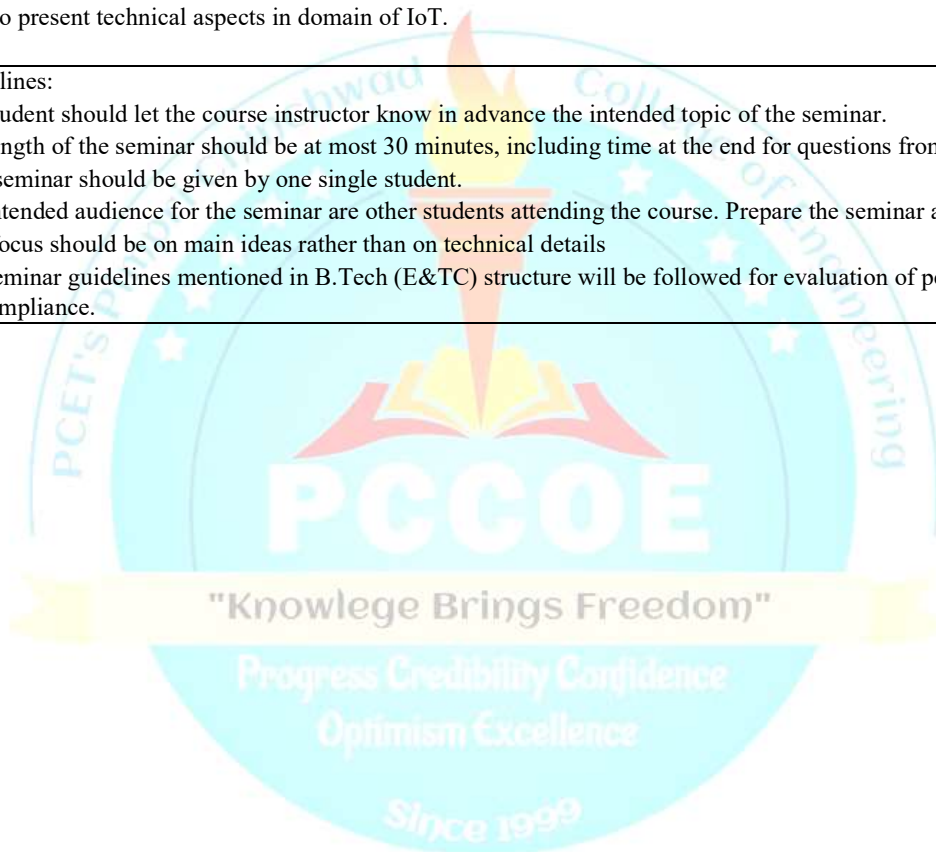
Program: B. Tech. (E&TC)-Minors in IoT				Semester :VI			
Course Name: IoT systems design Lab				Course code :BET26MN12			
Teaching Scheme (Hrs./Week)				Evaluation Scheme and Marks			
Credit	Theory	Practical	Tutorial	TW	OR	PR	Total
1	-	2	-	25	25	-	50
Pre-requisites:							
<ol style="list-style-type: none"> 1. Programming languages 'C' & Python. 2. Interfacing with microcontroller. 							
Course Objectives:							
<ol style="list-style-type: none"> 1. To deliver practical knowledge of interfacing of sensors and actuators with Raspberry Pi. 2. To deliver practical hands-on using cloud based interfacing with Arduino uno and Rpi. 3. To design IoT applications using Node-RED tool with RPi 4. To deliver the knowledge of NodeMCU to design various IoT applications 							
Course Outcomes:							
On the completion of the course, students will be able to,							
<ol style="list-style-type: none"> 1. Select appropriate sensors, actuators, cloud platform for designing IoT applications. 2. To Design IoT based realtime monitoring system using an appropriate cloud platforms. 3. Automate the systems using various sensors, actuators and cloud platforms 							
Detailed Syllabus:							
List of Experiments (Any 6)							
Expt. No.	List of Experiments						
1	To detect occupancy of an area using PIR sensors						
2	Web-based home automation using Arduino Uno and Bluetooth						
3	Installation of Noobs/Raspbian OS in Raspberry Pi						
4	Home Automation using Node-RED and Raspberry Pi						
5	Introduction to the MQTT Protocol on NodeMCU						
6	Interfacing and programming of actuators.						
7	Temperature and Humidity monitoring using Node-Red and Raspberry Pi						
8	Web based device control.						
Textbooks:							
<ol style="list-style-type: none"> 4. Programming the Raspberry Pi: Getting Started with Python, Simon Monk, 2nd Edition, ISBN: 978-1259587405, Tata McGraw Hill Publication. 2012 5. Pethuru Raj and Anupama C. Raman, "The Internet of Things: Enabling Technologies, Platforms, and Use Cases", CRC Press, 2017 6. Arduino for Dummies, John Nussey, 2nd Edition, ISBN: 978-1119489542, For Dummies Publishing, 2018 							
Reference Books:							
<ol style="list-style-type: none"> 1. Daniel Minoli, "Building the Internet of Things with IPv6 and MIPv6: The Evolving World of M2M Communications", ISBN: 978-1-118-47347-4, Wiley Publications, 2013 4. Programming Arduino: Getting started with sketches, 2nd Edition, Simon Monk, ISBN: 978-1259641633, Tata McGraw Hill Publication. 5. Exploring Raspberry Pi: Interfacing to the real world with Embedded Linux, Derex Molly, 1st Edition, ISBN: 978-1119188681, Wiley Publication, 2016 4. Arduino Programming in 24 hours, Richard Blum, 1st Edition, ISBN: 978-0672337123, Sams Tech Yourself Publishing, 2014 							

Program: B. Tech. (E&TC)-Minors in IoT				Semester: VII/VIII			
Course: Technologies Enabling IoT				Code: BET27MN11/BET28MN12			
Teaching Scheme (Hrs./Week)				Evaluation Scheme and Marks			
Credit	Lecture	Practical	Tutorial	FA		SA	Total
				FA1	FA2		
04	4	-	--	20	20	60	100
Prior knowledge of							
<ol style="list-style-type: none"> 1. Fundamental knowledge of communication 2. Fundamental knowledge of microcontrollers is essential 							
Objectives:							
<ol style="list-style-type: none"> 1. Students will get an exposure to the different IoT enabling technologies. 2. Students will understand the handling huge amount of data for its analysis. 3. Students will learn the contemporary aspects like cloud computing. 4. Students will learn the different applications of IoT aligned with Industrial Automation and Smart cities . 							
Outcomes:							
After learning the course, the students should be able to:							
<ol style="list-style-type: none"> 1. Understand the hardware required for building an IoT system 2. Comprehend the concepts of WSN and choose the required communication protocol 3. Identify the required cloud service based on the requirement 4. Handle and analyze the big data. 5. Analyze Industrial IoT business Model 6. Apply the IoT enabling technologies for the development of an IoT system 							
Detailed Syllabus:							
Unit							Duration
1	Embedded Systems						10
	<ul style="list-style-type: none"> <input type="checkbox"/> Introduction to IoT Boards, <input type="checkbox"/> IoT deployment for Raspberry Pi /Arduino/Equivalent platform – Interfacing of Sensors and actuators, <input type="checkbox"/> Communication: Connecting microcontroller with mobile devices communication through Bluetooth and wifi 						
2	Wireless Sensor Network						10
	<ul style="list-style-type: none"> <input type="checkbox"/> What is WSN? WSN node, Anatomy of the network node, Architecture of WSN, Types of WSN <input type="checkbox"/> WSN standards: IEEE 802.15.4, Low rate WPAN, Zigbee, Wireless HART, 6LOWPAN, Zwave, BLE, LoRA. <input type="checkbox"/> Protocol stack of WSNs 						
3	Cloud Computing						10
	<ul style="list-style-type: none"> <input type="checkbox"/> Introduction to Cloud Computing(concept, architecture, working) <input type="checkbox"/> Introduction to Cloud service models- SaaS, PaaS, IaaS, NaaS, IaaS, DbaaS <input type="checkbox"/> Cloud Platforms: Google App Engine, Amazon Web Services, Microsoft Azure Cloud services, Windows Azure Platform Appliance. <input type="checkbox"/> Distributed Computing: Need, Distributed computing vs. Cloud computing 						
4	Big Data						10
	<ul style="list-style-type: none"> ● Introduction to Big data, Types of data, Characteristics of Big data, ● Data handling technologies, Flow of data, Data acquisition, Data storage, ● Introduction to Hadoop, Introduction to Data Analytics, Types of data analytics-Local Analytics, Cloud analytics and applications 						
5	Introduction to Industrial IoT:-						10
	Business Model and Reference Architecture: IIoT-Business Models, IIoTSensing, IIoTCommunication ,IIoTSecurity and Fog Computing.						
6	Industrial IoT Applications						10
	<ul style="list-style-type: none"> ● Home Automation, Industrial IoT, Logistics, Driver assistance, collision impact, Inventory Management & Quality Control 						

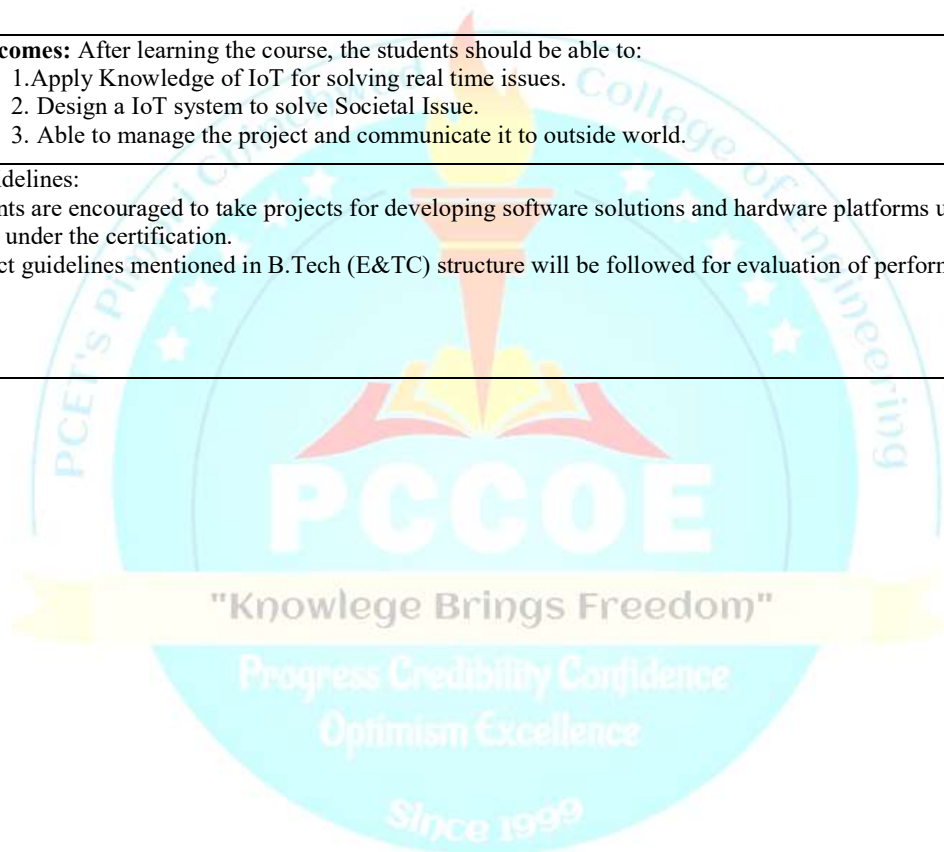
	<ul style="list-style-type: none"> ● Smart Cities, Environmental Protection, Lavatory maintenance, Water quality, Power Plants ● Food, Warehouse, Retail, Energy management, Agriculture, Health and Lifestyle, Facility Management 	
Total Hrs.		60
<p>Text Books:</p> <ol style="list-style-type: none"> 1. Pethuru Raj and Anupama C. Raman, "The Internet of Things: Enabling Technologies, Platforms, and Use Cases", CRC Press, 2017 2. Olivier Hersent, David Boswarthick, and Omar Elloumi, —The Internet of Things: Key Applications and Protocols, Wiley Publications, 2012 3. Giacomo Veneri Antonio Capasso, “Hands-On Industrial Internet of Things”, Packt Publications, January 2018 <p>Reference Books:</p> <ol style="list-style-type: none"> 1. HakimaChaouchi, — The Internet of Things Connecting Objects to the Web ISBN : 978-1- 84821- 140-7, Wiley Publications, 2013 2. Kazem Sohraby, Daniel Minoli and Taieb Znati, — Wireless Sensor Networks Technology, Protocols, and Applications—, John Wiley & Sons, 2010. 3. Holger Karl and Andreas Willig, —Protocols and Architectures for Wireless Sensor Networks, John Wiley & Sons, Ltd, 2007. 4. Daniel Minoli, —Building the Internet of Things with IPv6 and MIPv6: The Evolving World of M2M Communications, ISBN: 978-1-118-47347-4, Wiley Publications, 2013 <p>MOOC courses:</p> <ol style="list-style-type: none"> 4. NPTEL course on “Components and Applications of IoT” by Dr. Sanjoy Parida, https://onlinecourses.swayam2.ac.in/arp19_ap52/preview 5. Coursera Course “Introduction to IoT and Embedded systems” by Ian Harris, https://www.coursera.org/learn/iot 6. NPTEL Course “Sensors and Actuators” by Prof. Hardik Pandya https://nptel.ac.in/courses/108108147 		



Program:	B. Tech. (E&TC)-Minors in IoT			Semester:	VII /VIII	
Course:	Seminar			Code:	BET27MN12/ BET28MN13	
Teaching Scheme (Hrs./Week)			Evaluation Scheme and Marks			
Credit	Theory	Practical	TW	OR	PR	Total
2	-	4	-	50	-	50
Prior Knowledge of: -- is essential.						
Course Objectives:						
<ol style="list-style-type: none"> To identify practical learning skills and concepts and learn to communicate it to society. To encourage personal growth of students and development of effective communication skills 						
Course Outcomes: After learning the course, the students should be able to:						
<ol style="list-style-type: none"> Able to review current trends in IoT. Able to present technical aspects in domain of IoT. 						
Detailed Guidelines:						
<ol style="list-style-type: none"> The student should let the course instructor know in advance the intended topic of the seminar. The length of the seminar should be at most 30 minutes, including time at the end for questions from the audience. Each seminar should be given by one single student. The intended audience for the seminar are other students attending the course. Prepare the seminar accordingly. The focus should be on main ideas rather than on technical details The seminar guidelines mentioned in B.Tech (E&TC) structure will be followed for evaluation of performance and certification compliance. 						



Program:	B. Tech. (E&TC)-Minors in IoT			Semester:	VII/VIII	
Course:	Project			Code:	BET28MN11/ BET27MN13	
Teaching Scheme (Hrs./Week)			Evaluation Scheme and Marks			
Credit	Theory	Practical	TW	OR	PR	Total
4	-	8	100	50	-	150
Prior Knowledge of: basics of hardware, software and services required for an IoT application						
Course Objectives: 1. To test students' knowledge of course implementation. 2. To make students ready for development of an IoT system						
Course Outcomes: After learning the course, the students should be able to: 1. Apply Knowledge of IoT for solving real time issues. 2. Design a IoT system to solve Societal Issue. 3. Able to manage the project and communicate it to outside world.						
Detailed Guidelines: 1. The students are encouraged to take projects for developing software solutions and hardware platforms using the concept of course taken under the certification. 2. The project guidelines mentioned in B.Tech (E&TC) structure will be followed for evaluation of performance and certification compliance.						



Department Vision and Mission

VISION:

To serve the society by creating competent Electronics and Telecommunication engineers with value added quality education.

MISSION:

To produce competent and cultured Electronics and Telecommunication engineers through quality education by imparting attitude, knowledge, skills, project-based learning using well defined teaching learning process and excellent learning facilities to serve the needs of society.

PROGRAM EDUCATIONAL OBJECTIVES (PEOS):

1. To provide sound foundation in mathematics, basic science and fundamentals of E&TC engineering to the students.
2. To provide students with good Electronics and Telecommunication Engineering breadth so as to enable them to comprehend, analyze, design, and create novel products and solutions for the real- life problem
3. To inculcate effective communication skills, teamwork spirit and professional ethics in students to meet employers need at large and prepare them for higher studies.
4. To create awareness among students about social commitment and responsibilities.

PROGRAM SPECIFIC OUTCOMES

1. Ability to comprehend and exhibit the competency in the areas of Electronics & Communication Engineering including Signal processing and Communication, VLSI and Embedded System, Computing and programming and Automation.
2. Ability to design and analyze the systems of Electronics & Telecommunication Engineering using state of the art hardware and software tools to address the needs of industry and society.
3. Ability to demonstrate proficiency to build research attitude, imbibe ethical values and strengthen/enhance professional competency for holistic development and build problem solving attitude to address the societal, environmental, health & safety issues.