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Internet of Things — Complete Syllabus (Open Elective-3, Option 2)

BTEUP Diploma in Electrical Engineering • 6th Semester • Session 2026-27

Subject 6.4.2 (Open Elective-3, Theory) (Q) • 50 Marks internal • 2 Credits • L 2 - P 0 •

Choose this OR Project Management • Qualifying only

About this document: Open Elective-3 (6.4) is a (Q) qualifying subject — compulsory to appear and pass, but marks are not included for percentage and division. Choose either this theory course or Project Management, or a certification course (not less than 20 hrs) from the approved providers.

Examination Scheme

Code	Paper	Type	L - P	Credits	Internal	External	Total
6.4	Internet of Things (Open Elective-3)	Theory (Q)	2 - 0	2	50	—	N/A
Open Elective-3 Total				2	50	—	N/A

What This Subject Aims To Do

To provide foundational knowledge of the Internet of Things — its architecture, components, networking, data handling and real-world applications — enabling students to understand and contribute to IoT systems across domains.

Unit-Wise Complete Topic List

Unit	Topic	Periods	Marks Share
I	Introduction to Internet of Things	05	20%
II	Design consideration of IoT	05	20%
III	Interfacing by IoT devices	07	22%
IV	Data Handling and IoT Platforms	07	22%
V	Applications, Projects and Future of IoT	04	16%

Unit I - Introduction to Internet of Things (05 periods, 20%)

Topics: Basic Definition of “Internet of Things (IoT)” ; Evolution and history of IoT; Technological trends enabling IoT: ubiquitous computing, cloud computing, low-cost sensors, wireless communication; IoT architecture overview: perception, network, and application layers; Impact of IoT on society: smart cities, healthcare, agriculture, transportation, and home automation; Challenges in IoT: privacy, security, scalability.

Unit II - Design consideration of IoT (05 Periods, 20%)

Topics: Overview of embedded systems in IoT; Components of an embedded system: microcontroller, sensors, actuators, memory, power supply; Interactions of embedded systems with the physical world; Introduction to Core hardware components and software tools most commonly used in IoT devices.

Unit III Interfacing by IoT devices (07 Periods, 22%)

Topics: Interaction between software and hardware in an IoT device; IoT networking basics: IP addressing, MAC, DNS, DHCP; Basic networking hardware: routers, switches, access points, gateways; Introduction to Structure of the Internet: client-server and peer-to-peer models; Overview of Wireless communication protocols: Wi-Fi, Bluetooth, ZigBee, LoRa, NB-IoT; Brief introduction to Cloud connectivity and MQTT/HTTP protocols.

Unit IV: Data Handling and IoT Platforms (07 Periods, 22%)

Topics: Role of data in IoT: sensing, logging, analysis, and actuation; Data acquisition and storage methods (local and cloud-based); Introduction to data analytics in IoT: basic visualization, dashboards; Overview of popular IoT platforms: ThingSpeak, Blynk, Google Firebase, AWS IoT; Real-time data monitoring and alerts; Security concerns and basic protection mechanisms (encryption, authentication, firewalls).

Unit V: Applications, Projects and Future of IoT (04 Periods, 16%)

Topics: Overview of Application domains: Smart home, Industrial IoT, Healthcare, Smart farming; Mini project ideas: Smart temperature logger, IoT-based light control, Air quality monitor; Social, ethical, and environmental implications of IoT; Career prospects and skills in IoT; Trends and future scope of IoT: AIoT, 5G, Edge Computing.

Reference Books (as listed in the syllabus)

- "Internet of Things" by Jeeva Jose – Beginner-friendly, suitable for diploma students, covers basics to applications
- "Internet of Things: A Hands-On Approach" by Arshdeep Bahga & Vijay Madisetti – Practical approach with architecture, design, and cloud integration
- "Getting Started with the Internet of Things" by Cuno Pfister – Ideal for Arduino beginners with sensor interfacing and networking basics
- "Internet of Things: Architecture and Design Principles" by Raj Kamal – Covers technical architecture, protocols, and design considerations
- "Exploring Raspberry Pi" by Derek Molloy – For advanced learners, focuses on Linux-based IoT development and hardware interfacing

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Source: BTEUP 3rd Year curriculum (folder2627), approved in C.D.C. meeting held on 16.07.2026. Topic lists follow the official syllabus; short explanations are the author's own plain-English summaries, not syllabus text.
Please confirm with your own polytechnic for any local changes.