



Electronics-II
Wireless Communication and Internet of Things
[CORE COURSE]

Semester: IV	Credits: 2	Subject Code: BS42106	Lectures: 36
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Course Outcomes:
<p>At the end of the course, the learner will be able to-</p> <ul style="list-style-type: none"> ● Ability to explain different wireless communication system and Different techniques used for same ● Ability to identify different types of architecture of short-range Wireless Technologies and design and manage its application ● Ability to recognize and practice the Basics of Internet of Things, upcoming technology ● Ability to apply and demonstrate the applications of IoT

Unit 1: Wireless Communication: Cellular Telephony	12
<ul style="list-style-type: none"> ● Overview of wireless communication ● Introduction of cellular telephony system: Cell structure, Cluster, Frequency reuse, handoff strategies, Co-channel and adjacent channel interference, block diagram of mobile handset ● Overview of Cellular Telephony generations: 2G, 3G (W-CDMA), 4G(LTE), 5G ● GSM: Architecture, frame structure, mobility management, ● GPRS: architecture, application 	

Unit 2: Short Range Wireless Technologies and Location Tracking	12
<ul style="list-style-type: none"> ● Short range Technologies: Bluetooth: Bluetooth architecture, Bluetooth protocol stack, Bluetooth frame structure ZigBee: Architecture, topologies, applications, RFID: working of RFID system, types of RFID tags, applications ● Location Tracking: GPS system Segments of GPS system (space segment, control segment, user segment), GPS receiver, working of GPS, Applications 	

Unit 3: IoT Architecture	8
<ul style="list-style-type: none"> ● Introduction to IOT: , M2M and IOT, Seven-layer architecture of IoT, Role of cloud in IoT, cloud topologies, Cloud access, Protocols in IoT, : ● Networking technologies: Low power local area networking (LPLAN), Low power wide area networking (LPWAN) technologies, comparison of LoRa, sigfox NB-IoT, Cat -M. 	

Unit 4: IoT Applications	4
<ul style="list-style-type: none"> ● Challenges in IoT: Power consumption, Physical security, durability, Secure Connectivity, Secure Data Storage, Data volume, Scalability ● Application domains ● Case studies: Case Study 1: Smart Irrigation system for Agricultural field, Case Study 2: Home Automation, Case Study 3: Smart Cities 	

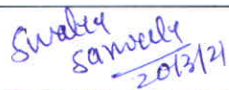


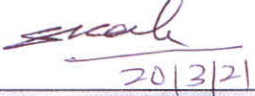
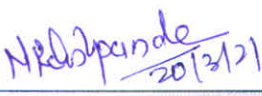
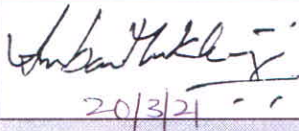

Board Of Studies	Name	Signature
Chairman (HoD)	Swatee Sarwate	<i>Swatee Sarwate</i>

Reference Books:

- Dr. Raj Kamal, *Internet of Things: Architecture and Design Principles*, McGraw Hill 2017
- Jochen Schiller, *Mobile Communications*, Jochen Schiller, Pearson publication- 2nd edition-2008
- Mayur Ramgir, *Internet of Things*, Pearson publication-1st edition -2019
- Rajkumar Buyya and Dastjerdi, *Internet of Things: Principles and Paradigms*, MK publishers- 1st edition-2012
- Rappaport, *Wireless Communications Principles and Practice*, Pearson publication -2nd edition-2010
- Theodore s. Rappaport, *Wireless communication*, PHI learning private ltd, 2002 edition
- Vijay Madiseti ,ArshdeepBahga, *Internet of Things(A Hands-on-Approach)* , Universities Press, 2015

Websites:

- <http://ndl.iitkgp.ac.in/document/TVBkSVpKTGZKMXhTTXJaYkIyeisrUWpvdGVGRzdVbjJhY1BJS05XTHNTbkdpS3VqQjFueHZ5OUplWDQvd08yZEZXTWNKNkxUZ3Z2OThKWjM4dzJnTkeE9PQ>
- [https://nptel.ac.in/content/storage2/courses/126104006/LectureNotes/Week-2_Mobile%20Wireless%20Communication%20\(Module-2\).pdf](https://nptel.ac.in/content/storage2/courses/126104006/LectureNotes/Week-2_Mobile%20Wireless%20Communication%20(Module-2).pdf)
- https://nptel.ac.in/content/storage2/courses/downloads/106106167/noc18_ee29_Assignmen t1.pdf
- [https://nptel.ac.in/content/storage2/courses/126104006/LectureNotes/Week-2_Mobile%20Wireless%20Communications%20-%20Introduction%20\(Module-1\).pdf](https://nptel.ac.in/content/storage2/courses/126104006/LectureNotes/Week-2_Mobile%20Wireless%20Communications%20-%20Introduction%20(Module-1).pdf)
- <https://nptel.ac.in/courses/106/105/106105166/>

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