

**NIRMA UNIVERSITY**  
**Institute of Technology**  
**B.Tech. Computer Science and Engineering**  
**Semester-VI**  
**Department Elective-I**

L	T	P	C
2	0	2	3

<b>Course Code</b>	2CSDE51
<b>Course Title</b>	Mobile Communications

**Course Outcomes:**

At the end of the course, students will be able to -

1. comprehend the key concepts and techniques of wireless and mobile communication
2. explain the architecture and develop applications of current and next generation wireless networks
3. apply concepts of wireless networks to design of ad hoc networks and sensor networks.

**Syllabus**

**Teaching  
Hours: 30  
06**

**Unit I**

**Introduction:** Applications and need for wireless network, wireless transmission, signals, antennas, signal propagation, Wireless Switching Technology, multiplexing, modulation, spread spectrum, medium access control, SDMA, TDMA, FDMA, CDMA, Wireless Networking Standards

**Unit II**

**Wireless PAN and LAN:** Basics, system architecture, protocol architecture, physical layer, MAC layer, management functions, WLAN standards, Bluetooth – standards, protocol stack and layers, IEEE802.15.4 - standard and protocol

**Unit III**

**Telecommunication systems:** Cellular network basics, introduction to 2G, 3G, 4G, building blocks of 5G: New Radio (NR) interface, network features: cloud RAN, 5G core, network slicing, virtualization

**Unit IV**

**Mobility Management:** Issues with mobility, mobility solutions at network and transport layer, Mobile IP, TCP variants to support mobility

**Unit V**

**Advanced topics:** Wireless Ad-hoc networks, issues and challenges, routing in WANET, Wireless sensor and body area network – characteristics, applications and architecture, IEEE 802.11p, Delay tolerant networks.

**Self-Study:**

The self-study contents will be declared at the commencement of semester. Around 10% of the questions will be asked from self-study contents.

**Laboratory Work:**

Laboratory work will be based on the above syllabus with minimum 6 experiments to be incorporated.

**Suggested Readings<sup>^</sup>:**

1. Jochen Schiller, Mobile Communications, Pearson
2. T.S. Rappaport, Wireless Communications: Principles and Practice, Pearson
3. Sunilkumar S. Manvi, Wireless and Mobile Networks, Concepts and Protocols, Wiley
4. C. Siva Ram Murthy and B.S. Manoj, Ad Hoc Wireless Networks: Architectures and Protocols, Pearson
5. Holger Karl and Andreas Willig, Protocols and Architectures for Wireless Sensor Networks, Pearson

L=Lecture, T=Tutorial, P=Practical, C=Credit

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<sup>^</sup>this is not an exhaustive list