

**Nirma University**  
**Institute of Technology, School of Technology**  
**MTech Computer Science and Engineering / MTech Computer Science and**  
**Engineering (Information and Network Security)**

Semester – II

L	T	P	C
2	0	2	3

<b>Course Code</b>	3CS12D205
<b>Course Title</b>	Mobile and Wireless Network Security

**Course Learning Outcomes (CLOs):**

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

1. comprehend the fundamental concepts of mobile and wireless network security
2. identify security threats in wireless networks and design strategies to manage network security
3. design secured network application considering all possible threats

**Syllabus**

**Teaching  
Hours**

**Unit I**

**Security in General Wireless/Mobile Networks:** High Performance Elliptic Curve Cryptographic Co-processor, An Adaptive Encryption Protocol in Mobile Computing

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**Unit II**

**Security in Wireless LANs:** Cross Domain Mobility Adaptive Authentication, AAA Architecture and Authentication for wireless LAN Roaming, Experimental Study on Security Protocols in WLANs

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**Unit III**

**Security in Ad Hoc Networks:** Pre-authentication and authentication models in Ad Hoc Networks, Promoting Identity-based key management, attacks and countermeasures, Secure and resilient data aggregation, Secure routing in MANET, Intrusion Detection System in MANET

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**Unit IV**

**Security in Mobile Cellular Networks:** Security issues in GSM, 3G and 4G networks, Authentication and encryption, Security concerns in 5G networks.

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**Unit V**

**Security in Sensor Networks and IoT:** Security Issues, Key Management Schemes, Secure Routing in Sensor Networks, Energy-aware security mechanisms, Security and privacy issues in IoT, Identity and access management, Data Integrity, Best practices for IoT security

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**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 above syllabus with minimum 5 experiments to be incorporated.

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

1. Y. Xiao, X. Shen, D. Z. Du, Wireless Network Security, Springer International Edition.
2. Lei Chen, Jiahuang Ji, Zihong Zhang, Wireless Network Security, Springer Science & Business Media
3. W. Stallings. Cryptography & Network Security: Principles and Practice, Prentice Hall
4. Nouredine Boudriga, Security of Mobile Communications, CRC Press
5. Levente Buttyán and Jean-Pierre Hubaux, Security and Cooperation in Wireless Networks, Cambridge University Press
6. James Kempf, Wireless Internet Security: Architectures and Protocols, Cambridge University Press
7. Patrick Traynor, Patrick McDaniel, and Thomas La Porta, Security for Telecommunications Networks, Springer
8. Frank Adelstein, Sandeep K.S. Gupta, Golden G. Richard III, and Loren Schwiebert, Fundamentals of Mobile and Pervasive Computing, McGraw-Hill Professional

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

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