



GUJARAT TECHNOLOGICAL UNIVERSITY

Master of Engineering

Subject Code: 3735905

Semester – III

Subject Name: Mobile & wireless communication security

Type of course:

Prerequisite: none

Rationale: Cellular mobile access networks (GSM, UMTS, and LTE) have become a ubiquitous part of the world-wide communication systems and are used in both personal and professional work. Access authorization and authentication, confidentiality, integrity, and location and tracking privacy are some of the highly important communication security properties. This course includes the wireless techniques used for day to day transactions and addresses the security issues involved.

Teaching and Examination Scheme:

Teaching Scheme			Credits C	Examination Marks				Total Marks
L	T	P		Theory Marks		Practical Marks		
				ESE (E)	PA (M)	ESE (V)	PA (I)	
3	0	0	3	70	30	0	0	100

Content:

Sr. No.	Content	Total Hrs
1	Introduction Wireless security, standardization, wireless security principles	4
2	Security of Wireless systems Effects of mobile broadband data, GSM, UMTS/HSPA, long term evolution, security aspects of Other networks Smart cards and secure elements Role of smart cards and SEs, contact cards, The SIM/UICC, contents of SIM, Embedded SEs, Other card types, contact less cards, Electromechanical characteristics of smart cards, smartcard SW, UICC communication	8
3	Wireless payment and access system Wireless connectivity as a Base for payment and access, E-commerce, Transport, Other secure system	5
4	Wireless security platforms and functionality Forming the base, Remote subscription management, Tokenization, other solution	6
5	Mobile subscription management Subscription management, OTA platforms, evolved subscription management	5
6	Security risks in wireless environment Wireless attack types, security flaws in mobile networks, protection methods, Errors in equipment manufacturing, self organizing network techniques for test and measurement Monitoring and protection techniques	8



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	Personal devices, IP core protection technique, HW fault and performance monitoring, security analysis, virus protection, legal interception, personal safety and privacy	
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Reference Books:

- 1) Wireless Communications Security, by Jyrki T. J. Penttinen Publisher: Wiley, Release Date: November 2016 ISBN: 9781119084396
- 2) Mobile Computing and Wireless Communications Paperback – Import, 2004 by Amjad Umar (Author)

Course Outcomes:

Sr. No.	CO statement	Marks % weightage
CO-1	Analyze the various wireless communication methods and existing security	30
CO-2	Analyze the working of smartcards and payment	20
CO-3	Identify security issues in wireless and mobile computing	30
CO-4	Evaluate the monitoring and protection mechanism.	20

List of Experiments:

- 1) Implement WTLS and SSL on handheld devices.
- 2) Install wireshark and analyze wireless traffic.
- 3) Use KISMET tool to analyze wireless network.
- 4) Set up and perform operations on mobile networks using OpenBTS.
- 5) Set up one cell GSM network. Enable cached authentication and link encryption.

Major Equipment:

Computer systems having following minimum technical configurations

Processor: i3 or i5 or higher

RAM : minimum 4 GB

HDD : 1 TB

Internet and wifi connectivity

Licence Window/Linux operating system



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List of Open Source Software/learning website:

<https://nptel.ac.in>

www.openbts.org