



GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering

Subject Code: 3173211

SYSTEM AND NETWORK SECURITY

B.E. 7th Semester

Type of course: Professional Elective

Prerequisite: Basics of Data Communication, Computer Networks, Basics of Number Theory

Rationale: The information exchanged through Internet plays vital role for their owners and the security of such information/data is of prime importance. Knowing the concepts, principles and mechanisms for providing security to the information/data is very important. The subject covers various important topics concern to security like symmetric and asymmetric cryptography, IP Security, key distribution, SSL, secure electronic transaction (SET), electronic money and overview of the malware technologies. The subject also covers the applications of all of these in real life applications.

Teaching and Examination Scheme:

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

Contents:

Sr. No.	Content	Total Hrs
1	Network Fundamentals: LANs, WANs, MANs, Network Software: Protocol Hierarchies, Design Issues in layers, Services Primitive, Critique of the OSI and TCP, Birth and Growth of the Internet, ARPANET, NSFNET, Common networks: X.25, ATM, Ethernet, WLANs	04
2	Introduction to Security issues: Security trends, OSI security architecture, Security attacks, Security services and Mechanism, Model of Network security	04
3	Symmetric Ciphers: Symmetric cipher model, Substitution techniques, Transposition techniques, Steganography, Block Cipher principles and Design issues, Data Encryption Standard, Advance Encryption Standard, Traffic Confidentiality, Key Distribution.	08
4	Public Key Cryptography: Principles, RSA Algorithm, Key Management, Deffie-Hellman Key Exchange	06
5	Network Security: Digital Signatures, Authentication Protocols, DSS, Kerberos, X.509 Authentication Services, Public Key Infrastructure, IP Security Overview, IP Security Architecture	07
6	Web Security: Introduction to PGP, Introduction to S/MIME, SSL, TLS, Secure Electronic Transaction (SET), SSL vs SET, 3D Secure protocol, Electronic money, Intrusion detection, Password Management	11
7	Malicious software: Viruses and Related Threats, Virus Countermeasures, Distributed Denial of Service attacks, Firewalls Design Principles, Trusted System	05



GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering

Subject Code: 3173211

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
20	20	15	5	5	5

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary from above table.

Books:

1. Computer Networks Fourth Edition Andrew S. Tenenbaum, Publisher: Prentice Hall
2. Cryptography and Network Security: Principles and Practices Fourth Edition William Stallings, Pearson.
3. Data Communication Networking Forth Edition Behrouz A.Forouzan.
4. Cryptography & Network Security, Forouzan, Mukhopadhyay, McGrawHill.
5. Cryptography and Network Security (2nd Ed.), Atul Kahate, TMH.
6. Information Systems Security, Godbole, Wiley-India.
7. Information Security Principles and Practice, Deven Shah, Wiley-India

Course Outcomes: Students will be able to

Sr. No.	CO Statement	Marks % Weightage
1	Learn fundamentals of network security	30
2	Understand the basic symmetric and asymmetric techniques and their relevance in securing the system	30
3	Understand the importance to safeguard their internet browsing activity and also able to utilize various tools for security.	20
4	Understand and apply web security in financial and commercial applications	20