GUJARAT TECHNOLOGICAL UNIVERSITY

INFORMATION & COMMUNICATION TECHNOLOGY (32)
SYSTEMS AND NETWORK SECURITY
SUBJECT CODE: 2183202
B.E. 8th SEMESTER

Type of course: UG

Prerequisite: Basics of Network

Rationale: NA

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks						Total Marks
L	T	P	C	Theory Marks			Practical Marks			
				ESE (E)	PA (M)		ESE (V)		PA (I)	
					PA	ALA	ESE	OEP		
3	0	2	5	70	20	10	20	10	20	150

Content:

Sr. No.	Content	Total Hrs	% Weightage
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	4	10
2	**Introduction to Security Issues.** Security Trends, OSI Security Architecture, Security attacks, Security Services and Security Mechanism, Model of Network Security	4	10
3	**Symmetric Ciphers.** Symmetric Cipher Model, Substitution techniques, Transposition techniques, Stegnography, Block Cipher principles and Design issues, Data Encryption Standard, Advance Encryption Standard, Traffic Confidentiality, Key Distribution.	8	20
4	**Public Key Cryptography.** Principles, RSA Algorithm, Key Management, Deffie-Hellman Key Exchange	6	15
5	**Network Security.** Digital Signatures, Authentication Protocols, DSS, Kerberos, X.509 Authentication Services,Public Key Infrastructure.	6	15
6	**Email Security and IP Security.** Introduction to PGP, Introduction to S/MIME, IP Security Overview, IP Security Architecture.	4	10
7	**Web Security.** Threats and Security Approaches, Secure Socket Layer. Secure Electronic Transaction, Intruders, Intrusion Detection, Password	6	10

	Management.		
8	**Malicious Software.** Viruses and Related Threats,Virus Countermeasures, Distributed Denial of Service attacks, Firewalls Design Principles, Trusted System	**6**	**10**

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
5	**15**	**15**	**15**	**10**	**10**

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 slightly from above table.

Reference 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 Outcome:

After learning the course the students should be able to: Understand basics of system and network security, different encryption and decryption algorithm.

List of Experiments: Experiments should cover topics of syllabus

List of Open Source Software/learning website: C, C++

ACTIVE LEARNING ASSIGNMENTS: Preparation of power-point slides, which include videos, animations, pictures, graphics for better understanding theory and practical work – The faculty will allocate chapters/ parts of chapters to groups of students so that the entire syllabus to be covered. The power-point slides should be put up on the web-site of the College/ Institute, along with the names of the students of the group, the name of the faculty, Department and College on the first slide. The best three works should submit to GTU.