

**Indian Institute of Information Technology,  
Design and Manufacturing Kancheepuram**

Course Code		Course Title	Computer and Network Security			
Department/ Faculty proposing the course	Dr Noor Mohammad Sk, CSE	Credits	L	T	P	C
			3	0	2	4
		Status	Core	<input type="checkbox"/>	Elective	<input checked="" type="checkbox"/>
To be offered for	B.Tech, M.Tech, PhD	Type	New	<input type="checkbox"/>	Modification	<input checked="" type="checkbox"/>
Prerequisite	Computer Networks, Operating System	Submitted for approval				
Learning Objectives	The course covers principles of computer systems and network security. Discussion about various attack techniques and how to defend against them. Topics include network attacks and defenses, intrusion detection and prevention, computer and network forensics, firewall and content filtering, security issues in the wireless and sensor networks.					
Learning Outcomes	Students can understand the need for security and the vulnerability, threat and attack and functions of the security appliances.					
Course Contents (with approximate breakup of hours for lecture/ tutorial/practice)	<b>Introduction to Computer Network Security:</b> Introduction, securing computer networks- hardware/software, forms of protection, security standards; Sources of vulnerabilities - assessment (L4) <b>Security challenges, Assessment, Analysis and Assurance:</b> sources of security threats, threat motives, management and correlation and security threat awareness; System security policy, Building a security policy, security requirement specification, Threat Identification and analysis, Vulnerability identification and assessment and security monitoring and auditing; Disaster Management, Resources for disaster planning and recovery (L6). <b>Access Control, Authorization and Authentication:</b> Access - Rights, Control systems; authorization- mechanisms, types, principles, and granularity; Authentication - factors and effectiveness, elements, types, methods and policy (L4). <b>Cryptography:</b> Symmetric Encryption, public key encryption, enhancing security and Key management; Public key Infrastructure, hash function and digital signatures (L4). <b>System Intrusion Detection and Prevention:</b> Intrusion detection mechanism, systems, types; Response to system intrusion, challenges to intrusion detection systems and implementations; Intrusion prevention systems. Computer forensics, network forensic and forensics tools (L6) <b>Firewall, Virus and Content Filtering:</b> firewall- types, configuration, implementations and limitations; Scanning, Filtering and blocking; Virus filtering and content filtering(L4) <b>Computer Network Security Protocols:</b> Application Level Security, Security in the Transport Layer, Network layer, Link layer - LANs WLAN security concerns and best practices for WI-FI security (L10) <b>Security in sensor networks:</b> Challenges, vulnerabilities and attacks, security mechanisms (L4) <b>Practice Component:</b> System Discovery & Attack Surface Enumeration and Threat Modeling - Identify and map digital assets, services, and potential entry points - Authentication & Session Management Failures - Sessions and identity across web applications - Hidden Input Vectors - Insecure Direct Object References & Authorization- Secrets Management & Code Leaks- Finding leaked secrets in source code and best practices for securely storing and rotating them. SSRF, Template Injections Exploit advanced injection flaws that target server-side internals, ways to defend against them. Internal Network Recon, Port Abuse, and Enumeration - Segmentation & Zero Trust Network Design - Firewall and IDS/IPS Misconfigurations and VPN and Remote Access Security – WiFi & Local Network Attacks - Security Logging, Monitoring, and Detection Engineering - Fix and Present: Red-to-Blue Lab. [P28]					
Text Books	Joseph Migga Kizza, A Guide to Computer Network Security, Springer, 2 <sup>nd</sup> Edition, December 2008, 9781447145424					
Reference Books	1. Nong Ye, Secure Computer and Network Systems Modeling, Analysis and Design, Wiley Publishers,1 <sup>st</sup> Edition, February 2008, 9780470023242 2. Matt Bishop, Introduction to Computer Security, Addison-Wesley, October 2004, 9780321247445 3. Cheswick, Bellovin, and Rubin, Firewalls and Internet Security: Repelling the Wily Hacker, 2 <sup>nd</sup> Edition, Addison-Wesley Professional, 2003, 9780201634662					