CAP790:SECURING NETWORK AND IT INFRASTRUCTURE

Course Outcomes: Through this course students should be able to

CO1 :: study the fundamental security concepts and planning of emerging computing systems.

CO2 :: explain the key security concepts, principles, requirements, and user authentication mechanisms.

CO3 :: demonstrate the basics of cryptography and the working of cryptographic algorithms.

CO4 :: illustrate the underlying vulnerabilities of Database and Network Security.

CO5 :: evaluate how to program and deploy countermeasures for keeping the software and operating systems securely.

CO6 :: express some common software vulnerability issues and security models.

Unit I

Basics of Computer Security : Overview of computer security concepts, Risks of computer systems, Security requirements and inadequacies, Basics of attacks, Internet threat model, Access control

Unit II

Encryption and Cryptography : Block & Stream ciphers, Symmetric encryption, Asymmetric encryption, Public-Key cryptography and Message authentication, Digital signatures, Digital certificates

Unit III

Trusted Systems : Access control principles and matrix, User authentication: Elements and types, Security models, Disaster recovery, Trusted computing and multilevel security

Unit IV

Operating System and Software Security : Introduction to operating system security, Identity and authentication, System security planning, Malicious code, Worms, Intruders, Applications security

Unit V

Database and Network Security : Need for database security, Integrity constraints in database, Commit protocols, Internet security protocols and standards, Threats in networks, SSL/TLS, DDoS

Unit VI

Securing Emerging Computing System : Cyber-Physical system overview and security, Internet-of-Things and smart grid security, Data & Infrastructure security in Cloud/Edge computing, Blockchain and Decentralized applications security

Text Books:

1. SECURITY IN COMPUTING by CHARLES P. PFLEEGER, PEARSON

References:

1. COMPUTER SECURITY: PRINCIPLES AND PRACTICE by WILLIAM STALLINGS AND LAWRIE BROWN, PEARSON