

# **System Security (M.Tech. Optional Core)**

Course Syllabus

July 2014

**Prerequisites:** Computer Networks, Operating Systems.

**Credits:** 3

## **UNIT - I: An Overview of Computer Security**

Confidentiality, Integrity, Availability, Threats Policy and Mechanism, Goals of Security, Assumptions and Trust, Assurance, Specification, Design. Policies for security confidentiality and integrity. Hybrid models

## **UNIT - II: Authentication, Entities and Systems for Enforcement**

Authentication, Physical Security, Access Control systems, Biometrics, Identity, Trust

## **UNIT - III: Security in Operating Systems**

Protected Objects and Methods of Protection, Secure Programs, Nonmalicious Program Errors, Viruses and Other Malicious Code, Trusted Operating System Design, Secure Programming, File and Memory security, Attacks, Threats, kernel flaws and vulnerabilities. Backups and recovery, Hardening of systems, Robust Programming

## **UNIT - IV: Case Study of Operating System Security**

Windows Security: Security components of Windows OS, Windows registry, Windows domains, Active Directory, Access Controls, Principals, Subjects Tokens, Security Identifiers, Privileges, Objects, Security Descriptors, ACE Matching, Microsoft Malware Protection Engine (MSMPENG), Baseline security analysis. Unix/Linux Security: Types of attacks, Unix system security checklist, Integrity Management, Auditing and Logging, Protecting Against Programmed Threats, Wrappers and Proxies, SUID or SGID loopholes, Patching and updates to software. Android and other Mobile OS Security.

## **UNIT - V: Legal Ethical, Privacy Issues Audits and Administration of Security**

Privacy Concepts, Privacy Principles and Policies, Computer Crime, Ethical Issues in Computer Use, Protecting Programs and Data, Forensics, Logging and Analysis,

Security Planning, Risk Analysis, Organizational Security Policies and enforcement

## **TEXTBOOKS/REFERENCES**

1. Ross J. Anderson, *Security Engineering: A Guide to Building Dependable Distributed Systems*, 2nd Edition, ISBN: 978-0-470-06852-6, 1080 pages, March 2008, Wiley
2. Charles P. Pfleeger and Shari Lawrence Pfleeger, *Security in Computing, 4/E*, ISBN-10: 0132390779 ISBN-13: 9780132390774, Pearson Education.
3. Matt Bishop, *Computer Security: Art and Science* ISBN 81-297-0184-7; 2003, Publisher Pearson Education (Singapore) Pte. Ltd.
4. Simson Garfinkel and Gene Spafford *Practical UNIX & Internet Security, 2nd Edition* ISBN 1-56592-148-8, 1996, O'Rielley