

## **CS-380 Introduction to Computer Security**

Course Contents

Course Code CS-380

Title Introduction to Computer Security

Credit hours 3 (3-0)

### **Objectives**

- i. Demonstrate knowledge of security threats
- ii. Create security policies to secure files and print resources
- iii. Demonstrate knowledge of cryptography, access control and authentication
- iv. Prevent against external attack
- v. Demonstrate knowledge of operational and organization security

### **Outcomes**

- i. The students should be able to explain security principles and evaluate the risks faced by computer systems.
- ii. The students should be able to explain how various attacks are carried out on the computer systems.
- iii. The students should be able to describe and generalize various software vulnerabilities and analyze and evaluate software systems for their security properties. The students should be able to explain and analyze how various security mechanisms work and correlate these security mechanisms with security principles.

### **Details of course**

- i. Introduction and Basics
- ii. Software Security: Vulnerabilities, Attacks, and Countermeasures
  - a. Privileged programs (Set-UID programs) and vulnerabilities

- b. Buffer Overflow vulnerability and attack
  - c. Return-to-libc attack
  - d. Race Condition vulnerability and attack
  - e. Format String vulnerability and attack
  - f. Input validation
  - g. Shellshock attack
- iii. Web Security: Vulnerabilities, Attacks, and Counter measures
  - a. Same Origin Policy
  - b. Cross-Site Scripting Attack
  - c. Cross-Site Request Forgery Attack
  - d. SQL-Injection Attack
  - e. Click-Jacking Attack
  - f. Web Tracking
  - g. Web Proxy and Firewall
- iv. Smartphone Security
  - a. Access control in Android operating system
  - b. Rooting Android devices
  - c. Repackaging attacks
  - d. Attacks on apps
  - e. Whole-disk encryption
  - f. Hardware protection: TrustZone

### **Recommended Readings / Text Books:**

- i. Du, Wenliang. Computer Security: a hands-on approach. CreateSpace, 2017.
- ii. Computer Security: Art and Science by Matt Bishop (ISBN: 0-201- 44099-7), Addison-Wesley 2003.

### **References**

- i. Security in Computing, 2nd Edition, Charles P. Pfleeger, Prentice Hall.
- ii. Security Engineering: A Guide to Building Dependable Distributed Systems, Ross Anderson, Wiley, John & Sons, Incorporated, 2001.
- iii. Building Secure Software: How to avoid the Security Problems the Right Way, John Viega, Gary McGraw, Addison-Wesley, 2002.