BRAC UNIVERSITY
Inspiring Excellence

CSE490: Introduction to Computer Security

Theory and Lab - 3 Credits

Objective

The objective of this course is to introduce theoretical as well as practical aspects of computer security. The emphasis of the course is on highlighting how and why different vulnerabilities exist within the domain of computer security and the mechanisms used to counteract those vulnerabilities. Important contemporary topics such as global perspectives of privacy and usability for security will also be covered in this course.

Learning Aims & Outcomes:

On successful completion of this module, students should have a solid theoretical as well as a practical understanding on different mechanisms of computer security to solve real-life issues.

Lab

Week	Topic
1	Introduction to command line environment (Linux)
2	Introduction to command line environment (Windows/PowerShell)
3	OS Hardening
4	Cryptographic Key Generation and Management
5	Cryptographic Libraries
6	Secure Programming
7	Web Applications Security
8	Password Storage and Cracking
9	Malware analysis
10	Usability Assessment (Cognitive Walkthrough)

Books

- Introduction to Computer Security - Michael Goodrich, Roberto Tamassia, First Edition
- Security Engineering – Ross Anderson

Syllabus

- ### Introduction
  Goals of computer security, models, players
  Different domains of computer security
  Physical security
- ### Cryptography Review
  Symmetric vs Asymmetric encryption
  Symmetric encryption: DES/AES
  Asymmetric/Public-key cryptography: RSA
  Key exchange and security protocols (Diffie-Hellman, Needham-Schroeder)
  PKI (Public Key Infrastructure)
  Cryptographic Hash Functions
- ### OS/Security
  OS Environment, Buffer overflow, Process security
- ### Malware
  Computer virus, Malware attacks, Countermeasures
- ### Network Security
  Data link layer security, Network layer security, Transport layer security
- ### Web Security
  SSL/TLS, Server-side attacks, Client-side attacks, Authentication and Passwords
- ### Usability
  Usability vs Security
  Why Johnny can’t Encrypt
  Human-centric Security
- ### Privacy
  Why privacy matters
  Privacy policy
  Global perspectives of privacy