EE406 Introduction to Computer and Network Security

Designation: Technical Elective

Course Description: We will discuss basic computer and network security issues in this course. We will first review basic networking and cryptography concepts, and then study algorithms and protocols used in computer and network security. We will further discuss practical security mechanisms, including Web security, TCP/IP security, firewalls, IPSec, Virtual Private Networks, intrusion detection systems, etc..

Credits: 3

Prerequisites: none

Class/Lab Schedule: 3 lecture hours per week

Topics Covered:
- Basic Computer Security Technology and Principles
- Basics of cryptography: symmetric and public-key encryption, certificates, cryptographic hash functions, pseudo-random number generators
- Authentication and key establishment
- Access Control
- Intrusion Detection
- Malicious software
- Denial of service, Internet worms, viruses, attacks on routing infrastructure
- Firewalls and intrusion detection systems
- Other Advanced security topics

Text Book and Other Required Materials:

Supplemental Text

Handouts/Notes and Supplemental Text: will be available on-line or distributed in classes.
Grading:
Homework, Projects, Quizzes 50%
midterm exam 20%
final exam 30%

Course Objectives and Their Relationship to Program Objectives:
The student learns the theory of probability and statistics that are relevant to engineering applications in communications, control, networking, electrophysics and computers. [Program Objectives this course addresses: 1, 2, 3, and 5.]

Course Outcomes and Their Relationship to Program Outcomes:
The following are the course outcomes and the subset of Program Outcomes (numbered 1-11 in square braces "[ ]") they address:
• Use of mathematics (probability, statistics, discrete math, basic graph theory,) to understand the theory behind modern cryptography. [1,3,5,9]
• Develop the ability to model engineering systems [1,3,5,8,9,10,11]
• Enhance the student’s ability to design an experiment and to analyze the resulting data [1,2,3,5,11]
• Emphasize the societal issues and advance of technology affecting the design secure systems [2,11]

Contribution of Course to Meeting the Professional Component
Computer System

Computer Usage:
Computer usage is required. C programming and UNIX system programming are used in assignments.

Design Credits and Features:
EE406 has 1 design credits.

Instructor(s): Yingfei Dong.

Person(s) Preparing Syllabus and Date: Yingfei Dong, June 12th, 2009