CPSC 4660/5910: System Vulnerability Analysis and Auditing

Instructor: Li Yang   **Office**:   314A EMCS
Phone: 423-425-4392   **Office Hours**: M/W: 10:00 – 12:00 am
Email: Li-Yang@utc.edu   T/R: 1:00 – 4:00 Pm
Class Meetings: T/R 12:15 – 1:300pm   **Classroom**: EMCS 302
Credit: 3 hours

Course Description

The course covers the assessment of systems to discover resources that are susceptible to damage if intrusions and unauthorized access occurs, the systematic examination of system resources to determine the adequacy of security measures in place, the identification security deficiencies in the system, the gathering of data from which to predict the effectiveness of the proposed security measures, and the confirmation of the adequacy of such measures after implementation. In addition, the estimation of the vulnerability of system resources to potential disaster hazards of unknown origin will also be covered.

Prerequisites: CPSC 1110 and 4550 or 4620 with grades of C or better and basic knowledge of information security.

Purpose and Objectives:

The purpose of the course is to give the students the knowledge and tools they need to manage system security and handle and manage system disasters. At the end of the course students should be able to carry out basic vulnerability tests on local computers and networks, interpret the test reports, and recommend appropriate remedies.

Course Requirements:

- Regular class attendance.
- Active class and laboratory participation in all discussions; this means spending some quality time reading and preparing for class and lab meetings and discussions
- One mid-term and a comprehensive final examination will be given. Examination make up will be on Reading Day.
- Individual extra credit assignments for the purpose of propping up a bad grade will not be given.
- Students will be required to sign a contract stating that they will not use knowledge acquired in this course for illegal or unethical purposes. This contract may be released to appropriate authorities should the student be suspected of illegal or unethical computer usage.
- Notes taking is encouraged.

Grading:

Grades will be based on the following:
30% Laboratory (team) projects (Projects will be assigned on a three week-basis and each project will demand both research and a 5-page, double-spaced, typewritten report).
30% Mid-term examination – covering text material and content of class discussions.
40% Final comprehensive examination – covering text material and content of class discussions

Grading Scale:

90+ = A; 80-89 = B; 70-79 = C; 60-69 = D; below 60 = F

Textbooks

Primary texts:

Matt Bishop, *Introduction to Computer Security*, Addison-Wesley, ISBN 0-321-24744-2

References:

1. Google Hacking for Penetration Testers
2. Counter Hack Reloaded: A Step-by-Step Guide to Computer Attacks and Effective Defenses.
3. Hacking Exposed: Network Security Secrets and Solutions, Sixth Edition

IA resources
Please check this link from the UTC InfoSec center for additional resources for your course work and paper: http://www.utc.edu/center-information-security-assurance/resources.php.

Tentative Course Outline

Week 1	Introduction	Footprinting
Week2	Footprinting	Lab
Week3	Scanning	Lab
Week4	Scanning	Lab
Week5	Enumeration	Lab
Week6	Enumeration	Lab
Week7	Exploitation	Lab
Week8	Exploitation	Lab
Week9	Post-Exploitation	Lab
Week10	Post-Exploitation	Lab
Week11	Security Principles	Lab
Week12	Malicious Logic	Lab
Week13	Auditing	Hacking and Defense
Week14	Presentation	Presentation

American with Disability Act
Attention: If you are a student with a disability (e.g. physical, learning, psychiatric, vision, hearing, etc.) and think that you might need special assistance or a special accommodation in this class or any other class, call the Office for Students with Disabilities/College Access Program at 425-4006 or go by the office, 110 Frist Hall. Examples of disabilities might include blindness/low vision, communication disorders, deafness/hearing impairments, emotional/psychological disabilities, learning disabilities, and other health impairments. This list is not exhaustive.

Counseling and Career Planning
If you find that personal problems, career indecision, study and time management difficulties, etc. are adversely affecting your successful progress at UTC, please contact the Counseling and Career Planning Center at 425-4438.

UTC's Honor Code

The UTC *Student Handbook* describes the Honor Code (pages 7 - 9), which includes the following examples of violations related to computer usage: (UTC Student Handbook page 7 paragraph B.2)

1. Making use of unauthorized assistance during an examination or in preparing a graded assignment
2. Plagiarism
3. Making unacknowledged use of another's computer program
4. Unauthorized use, or misuse, of the University's computing facilities such as:
    *   Logging on to an account without the knowledge and permission of the owner
    *   changing, deleting, and adding to the programs, files and data without authorization of the owner
    *   Theft of program data and machine resources
    *   attempts to thwart security of any computer system
    *   attempts to disrupt the normal operations of any computer system

Any suspected Honor Code violation in this course will be forwarded to the Honor Court for action, and an F will be assigned for the course grade. All graded work in this course is subject to the Honor Code, including examinations, programming exercises, and any written work prepared for the course.

Email Announcement

To enhance student services, the University will use your UTC email address (firstname-lastname@utc.edu) for communications. (See http://onenet.utc.edu for your exact address.) Please check your UTC email on a regular basis. If you have problems with accessing your email account, contact the Help Desk at 423/425-4000.

Important Dates

Class begins	August 23
Last Day to Withdraw without a W	September 3
Labor Day holiday	September 6
Midterm grade notifications	October 4 - October 8
Last Day to Withdraw	October 22 with a W
Fall Break	October 25-26
Thanksgiving Holiday	November 24-26
Last Day of Classes	December 6
Final Exam	December 8-14