

## CPSC4620 Computer Network Security

<b>SEMESTER:</b>	Spring 2012	<b>CRN:</b>	21102
<b>INSTRUCTOR:</b>	Li Yang	<b>E-MAIL:</b>	Li-Yang@utc.edu
<b>LECTURES:</b>	T/R 1:40 - 2:55pm	<b>LOCATION:</b>	EMCS 302/323
<b>PHONE:</b>	423-425-4392	<b>OFFICE:</b>	EMCS 314A
<b>OFFICE HOURS:</b>	M/T/W/R 1:00pm-4:00pm		
<b>CREDIT:</b>	3 hours		

### COURSE DESCRIPTION

A study of key security issues and procedures in computer and mobile communication networks. Among the issues to be discussed are: the security of LANs, WANs, databases, and network operating systems; threats to computer networks through exploitation of network infrastructure design weaknesses; security flaws in the network infrastructure protocols; security of content in computer network services; risk assessment and security policies; and security in mobile communication networks. Procedures will include: network intrusion detection and forensics technologies, cryptographic and authentication systems, capability and access control mechanisms, and new developments in Internet routing and transport protocols, secure mail, directory, and multimedia multicast services. Current trends and research in security policies and technologies will also be discussed.

Prerequisite: CPSC 4550 or 5550 or approval of department head.

### COURSE OUTCOMES

- Provide students with a high-level understanding of how information security functions in an organization.
- To master understanding external and internal threats to an organization,
- To be familiar with information security awareness and a clear understanding of its importance,
- To be familiar with how threats to an organization are discovered, analyzed, and dealt with,
- To master fundamentals of secret and public cryptography,
- To master protocols for security services,
- To be familiar with network security threats and countermeasures,
- To be familiar with network security designs using available secure solutions (such as PGP, SSL, IPSec, etc),
- To be familiar with advanced security issues and technologies (such as DDoS attack detection and containment, and anonymous communications,),
- To be exposed to original research in network security,
- To be exposed to the importance of integrating people, processes and technology

**CLASS PARTICIPATION/ATTENDANCE POLICY:** 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.

**LATE ASSIGNMENT SUBMISSION/MAKE-UP POLICY:** There will be no make-up tests. **Failure to take the final exam will result in failing the course.** All assignments are to be turned in on or before the assigned due date. You must demonstrate that your lab or assignment is working properly. **No assignment will be accepted and a grade of zero will be assigned for that assignment.**

**COURSE REQUIREMENTS**

- One mid-term and a comprehensive final examination will be given.
- 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.
- Taking notes is encouraged.

**EVALUATION/ASSESSMENT:**

Grades will be based on the following:

Undergraduate
30% Labs (weekly)
20% projects (team) (Projects will be assigned on a 2 or 3 week-basis and each project will demand both a 5-page, double-spaced, typewritten report).
20% Mid-term examination – covering text material and content of class discussions.
20% Final comprehensive examination – covering text material and content of class discussions
10% presentation

Final Grade will be determined by the standard UTC grading policy with the exception that there will be no D grade given. You must make a C or better to continue with your course work. Incomplete (I) will not be given in this course.

Score	Letter Grade
90-100	A
80-89	B
70-79	C
Below 70	F

**TEXTBOOKS:**

- Michael T. Goodrich & Roberto Tamassia, Introduction to Computer Security, ISBN-13: 978-0-321-51294-9, ISBN-10: 0-321-51294-4, Pearson, 2011.
- Vincent Nestler, Gregory White, wm. Arthur Conklin, Principles of Computer Security: CompTIA Security+ and Beyond – Lab Manual, ISBN: 978-0-07-174856-8, MHID: 0-07-174856-3, McGraw Hill, 2011.

**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**

Topic 1:	Introduction: CIA, Access Control, Implementation and Usability
Topic 2:	Physical Security: Authentication, TEMPEST, RFID, Biometrics
Topic 3:	Operating System Security: Process Security, Memory and File System security
Topic 4:	Operating System Security Application Program Security
Topic 6:	Malware: Insider Attacks, Malware, Privacy-Invasive Software, Countermeasures
Topic 7:	Network Security: ARP, ICMP, Sniffing, IP Spoofing
Topic 8:	Network Security: TCP, UDP, NAT, TCP Session Hijacking, DoS
Topic 9:	Network Security: DNS, Firewall, SSH, IPsec, VPN
Topic 10:	Network Security: IDS, Honey pots, Wireless security
Topic 11:	Web Security
Topic 12:	Cryptography
Topic 13:	Security Models and Practice
Topic 14:	Distributed-Applications Security

#### **COURSE WEBSITE AND COMMUNICATION:**

To enhance student services, the University uses your UTC email address for all communications. (See <http://www.utc.edu/> for your exact address.) Please check your UTC email on a regular basis [here you might add what you consider a regular basis to be]. If you have problems with accessing your email account, contact the Help Desk at 423/425-4000. We will be using the Blackboard system (**bb4.utc.edu**). You may access lecture notes, assignments, and your grades through this system. I will use the blackboard system to communicate with you via email. I can be reached by email during the week. I generally read my email on the weekend but **CANNOT** guarantee I will read or answer my email **on the weekend**. I will also **NOT** guarantee I will answer my email **after 6 pm**, which includes the night before exams.

**ADA STATEMENT:** 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 at 425-4006, come by the office - 102 Frist Hall or see <http://www.utc.edu/OSD/>

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 or <http://www.utc.edu/Administration/CounselingAndCareerPlanning/>.

#### **INFORMATION ON PLAGIARISM AND CHEATING (from the UTC Student Handbook):**

##### **PLAGIARISM:**

Please read and heed the following information regarding academic dishonesty. The instructor cannot and will not tolerate academic dishonesty. For more information, refer to the UTC Student Handbook. What is cheating?

- Supplying or using work or answers that are not your own.
- Providing or accepting assistance with completing assignments or examinations.
- Faking data or results.
- Interfering in any way with someone else's work.
- Stealing an examination or solution from the teacher.

What is plagiarism?

- Copying a paper from a source text without proper acknowledgment. NOTE: All references should use the APA Style for formatting.
- Buying a paper from a research service or term paper mill.
- Turning in another student's work with or without that student's knowledge.
- Copying materials from a source text, supplying proper documentation, but leaving out quotation marks.
- Paraphrasing materials from a source text without appropriate documentation.
- Turning in a paper from a term paper website.

The instructor of this class reserves the right to submit papers to the UTC Online (Blackboard) text-matching software (SafeAssign) for review and analysis of originality and intellectual integrity. If the results of the review indicate academic dishonesty, disciplinary action may be taken against the student as outlined in the UTC Student Handbook.