

CSCI 581 – Computer and Network Security (Graduate Course)

(Last modified 8/26/2012)

Instructor: Jinoh Kim, Ph.D.

Office: JOUR 217

Office Hours: M 3:30 PM - 5:30 PM, T 11:00 AM – 6:00 PM, TR 4:30 PM – 5:30 PM

Email: jinoh.kim@tamuc.edu

(please indicate the course number in the email subject line)

Class Meeting:

Location: SS124

Time: R1:30-4:10

Course Description:

Security is becoming one of the core requirements in the design of critical systems. This course will introduce students to computer security and applied cryptography. Students will learn the concepts in computer security including software vulnerability analysis and defense, networking, wireless sensor networks security, and applied cryptography. Students will also learn the fundamental methodology for how to design and analyze security critical systems.

Expected Student Learning Outcomes:

- Understand basic security principles
- Gain knowledge about applied Cryptography techniques, including symmetric primitives (block ciphers, stream ciphers, hash functions) and asymmetric primitives (public-key encryption and signature algorithms)
- Learn Operating Systems protection features and techniques
- Understand network security concepts and techniques (SSL/TLS, IPsec, SSH)
- Explore state-of-the art security topics and techniques (e.g., sensor network security)

Prerequisites:

CSCI 434 – Introduction to Local Area Networks or a graduate level course in networking

Text Book:

- **Security in Computing**, Charles P. Pfleeger and Shari Lawrence Pfleeger, 4th edition, Prentice Hall, ISBN 10: 0132390779

Reference:

- **Introduction to Cryptography with Coding Theory**, Wade Trappe, Lawrence C. Washington, second edition, Pearson, ISBN 10: 0131862391

Course Content:

Overview (Week 1)

- Introduction to computer Security
- Basic Security Properties

Cryptography (Week 2–4)

- Introduction to classical Crypto
- Crypto: DES and AES
- Public key encryption
- Hashes and MAC

Program Security (Week 5-6)

- Buffer Overflow and defenses
- Viruses and Malware

Operating Systems Security (Week 7)

- Protection
- User authentication

Midterm Exam (Week 8)

Networks Security (Week 9–11)

- TCP/IP Threats
- PKI + IPsec
- SSL/TLS
- DDOS attacks
- Firewalls, intrusion detection systems

Advanced security topics (Week 12-14)

- Sensor network security
- Trust computing

Final Exam (Week 15)

Late Policy:

The deadline for any assignment can be extended with a 15% penalty per day. No deadline can be extended by more than two days. Assignments will NOT be accepted 48 hours after the due date.

Collaboration Policy:

Students are encouraged to talk to each other, to the instructor, or to anyone else about any of the assignments. Any assistance, though, must be limited to discussion of the problem and sketching general approaches to a solution. Each student must write out his or her own solutions to the homework. Consulting another student's or group's solution is prohibited, and submitted solutions may not be copied from any source. These and any other form of collaboration on assignments constitute cheating. If you have any question about whether some activity would constitute cheating, please feel free to ask.

Grading Policy:

- 15% Homework
- 30% Project
- 20% Midterm exam
- 30% Final Exam
- 5% Class participation

Grading Scale:

- A: 100-90
- B: 89-80
- C: 79-70
- D: 69-60
- F: Below 60

Academic integrity:

Your commitment as a student to learning is evidenced by your enrollment at Texas A &M University-Commerce. "All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment." (See Student's Guide Handbook, Policies and Procedure, Conduct). All phones, pagers, and other communication devices are to be turned off or place on silent mode during class. Instances of academic dishonesty will not be tolerated. Cheating on exams or plagiarism (presenting the work of another as your own, or the use of another person's ideas without giving proper credit) will result in a failing grade and sanctions by the University. For this class, all assignments are to be completed by the individual student unless otherwise specified.

Makeup Policy:

There will be no makeup exams in general. Makeup exams may be given to students under extreme circumstances, such as hospitalization, serious injury, death in the family, etc, with valid documents.

Students with Disabilities:

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact:

Office of Student Disability Resources and Services
Texas A&M University-Commerce
Gee Library, Room 132
Phone (903) 886-5150 or (903) 886-5835
Fax (903) 468-8148
StudentDisabilityServices@tamu-commerce.edu

Basic Tenets of Common Decency:

"All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment." (Student's Guide Handbook, Policies and Procedures, Conduct.) This means that rude and/or disruptive behavior will not be tolerated.

Disclaimer:

This syllabus is meant to provide general guidance of what to expect from this course. The instructor reserves the right to make changes as appropriate based on the progress of the class. All changes made to this syllabus during the semester will be announced. This document has been posted electronically. If you print a copy of it, please be sure to consult the last modified date of the online version to verify that your printed copy is current.