COURSE SYLLABUS

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YEAR COURSE OFFERED: 2025

SEMESTER COURSE OFFERED: Spring

DEPARTMENT: Department of Computer Science

COURSE NUMBER: COSC 3371

NAME OF COURSE: Cybersecurity

NAME OF INSTRUCTOR: Stephen Huang

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The information contained in this class syllabus is subject to change without notice. Students are expected to be aware of any additional course policies the instructor presents during the course.

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Learning Objectives

This course provides a broad introduction to cyber security, including cryptography, network security, and system security. After completing the course, students will be familiar with the theoretical foundations of security (e.g., foundations of cryptographic algorithms and protocols), with widely used security protocols (e.g., SSL), and with practical attack and defense techniques (e.g., software vulnerability exploits and firewalls).

Major Assignments/Exams

- Homework assignments, quizzes, attendance (40%)
- Midterm exam (20%)
- Final exam (40%)

Required Reading

- Lecture slides

Recommended Reading

- Charles P. Pfleeger, Shari Lawrence Pfleeger, Jonathan Margulies, "Security in Computing" (5th Edition or later), Prentice Hall Press, 2015
- William Stallings, "Cryptography and Network Security: Principles and Practice" (5th Edition or later)

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List of discussion/lecture topics

- Introduction to cryptography, classic ciphers
- Stream ciphers, block ciphers
- Asymmetric-key cryptography
- Hash functions, message integrity, digital signatures
- Cryptographic protocols, PKI
- WiFi security
- IPSec, SSL, SSH
- E-mail security
- Access control and authentication
- Software vulnerabilities and exploits, secure coding techniques
- Malware, adversarial tactics, techniques, and procedures
- Firewalls, isolation, intrusion detection and prevention, penetration testing
- Denial of services attacks and their mitigation
- Optional special topics (blockchains and cryptocurrencies, security economics)

Honor Code Statement

Students may be asked to sign an honor code statement as part of submitting any graded work, including but not limited to projects, quizzes, and exams: "*I understand and agree to abide by the provisions in the University of Houston Undergraduate Academic Honesty Policy. I understand that academic honesty is taken very seriously and, in the cases of violations, penalties may include suspension or expulsion from the University of Houston.*"

Syllabus Changes

Please note that the instructor may need to modify the course syllabus and may do so at any time. Notice of such changes will be announced quickly (e-mail or on the course website).