CS 315 Computer Security

(计算机安全)

Instructor: Fengwei Zhang

Who Am I?

- Fengwei Zhang
  - Associate Professor of Computer Science
  - Office: Innovation Park Building 10, Room 404
  - Email: TBA
  - Website: http://fengweiz.github.io

- Course Information
  - Course website: http://fengweiz.github.io/19fa-cs315/index.html

Why Study Security?

Why Study Security?

It's cool to be a hacker

It's a hot topic and media talk about it

It's useful for finding a job

Course Overview

- This course aims help students to learn the principles of computer security and understand how various security attacks and countermeasures work

- Providing hands-on experience in playing with security software and network systems in a live laboratory environment

- Taking both offensive and defense methods to help student explore security tools and attacks in practice

- Focusing on attacks, hacking fundamentals, defenses.

Course Objectives

- Understanding on real-world security vulnerabilities, exploits and defenses

- Having hands-on labs in network and system security experiments

- Learning knowledge of practical security problems and their solutions

Course Labs

- Lab 1: Packet Sniffing and Wireshark
- Lab 2: Buffer Overflows and Defense
- Lab 3: Scanning and Reconnaissance
- Lab 4: Metasploit Framework
- Lab 5: Reverse Engineering and Obfuscation
- Lab 6: OS Security for the Internet of Things

Course Labs

- Lab 7: Wireless Exploitation & Defenses

- Lab 8: Firewalls & Intrusion Detection Systems (IDS)

- Lab 9: Dirty COW Attack

- Lab 10: Format-String Vulnerability

- Lab 11: Web Security

- Lab 12: Return-to-libc and Return Oriented Programming

Lab Assignments

- 12 lab assignments
  - Source code
  - Write up PDF

Term Projects

- A research project with 2-5 individuals
  - building a new system
  - improving an existing technique
  - performing a large case study
- Project proposals due on Feb 20
  - a 2-page description
- Project presentations are on December 16 & 23
- Project final reports due on December 23

Course Prerequisites

- Familiar with Linux/Unix Commands

- It would be better if you know:
  - Basic C, Java, Assembly, etc.
  - Operating systems
  - Computer networks

Policies on Late Submissions

- Lab and project deadlines will be firm.

- Late homework will be accepted with a 10% reduction in grade for each day they are late by.

- Once a homework assignment is discussed in class, submissions will no longer be accepted.

Grading Policy

Topics	Grade
Class Participation	80
Lab 1: Packet Sniffing and Wireshark	60
Lab 2: Secure Coding and Buffer Overflows	60
Lab 3: Scanning and Reconnaissance	60
Lab 4: Penetration Testing	60
Lab 5: Reverse Engineering and Obfuscation	60
Lab 6: Internet of Things Security & Privacy	60
Lab 7: Wireless Exploitation & Defenses	60
Lab 8: Firewalls & Intrusion Detection Systems (IDS)	60
Lab 9: Dirty COW Attack (IDS)	60
Lab 10: Secure Coding and Format-String Vulnerability	60
Lab 11: Web Security	60
Lab 12: Return-to-libc & Return Oriented Programming	60
Term Project Proposal	50
Term Project Presentation	50
Term Project Report	100
Total	1000

Grading Scale

The grades for the course will be based upon the percentages given below

A	90 - 100%	C	70 - 73%
A-	87 - 89%	C-	67 - 69%
B+	84 - 86%	D+	64 - 66%
B	80 - 83%	D	60 - 63%
B-	77 - 79%	D-	57 - 59%
C+	74 - 76%	F	0 - 56%

Academic Integrity

- Students need to sign the Assignment Declaration Form in your first lecture.

- Our department can refuse students to choose the CSE Major if they do not sign the declaration form.

Academic Integrity

計算機科學與工程系
Department of Computer Science and Engineering

本科生作业承诺书

本人_____（学号_____）本学期已选修计算机科学与工程系
_____课程。本人已阅读并了解《南方科技大学计算机科学与工程系
本科生作业抄袭学术不端行为的认定标准及处理办法》制度中关于禁止本科生
作业抄袭的相关规定，并承诺自觉遵守其规定。

承诺人：

计算机科学与工程系
Department of Computer Science and Engineering

Undergraduate Students Assignment Declaration Form

This is_____(student ID:_____, who has enrolled
in _____ course, originated the Department of Computer Science and
Engineering. I have read and understood the regulations on plagiarism in
assignments and theses according to "Regulations on Academic Misconduct in
Assignments for Undergraduate Students in the SUSTech Department of Computer
Science and Engineering". I promise that I will follow these regulations during the
study of this course.

Signature：

Student Disabilities Services

- If you have a documented disability that requires accommodations, you will need to register with the University for coordination of your academic accommodations, and let me know.

Other Resources

- Course Website:
  - https://fengweiz.github.io/19fa-cs315/index.html

- Instructor homepage:
  - https://fengweiz.github.io

Discussion

- Using and Subscribing a course mailing-list?

Lab Session

- Lab 1: Packet Sniffing and Wireshark
  - Be prepared!