



CS 315 Computer Security

(计算机安全)

Instructor: Fengwei Zhang



Who Am I?

- Fengwei Zhang

- Associate Professor of Computer Science
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- Course Information

- Course website:
<http://cse.sustech.edu.cn/faculty/~zhangfw/20fa-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: Secure Coding and Format-String Vulnerability
- Lab 4: Scanning, Reconnaissance, and Penetration Testing
- Lab 5: Reverse Engineering and Obfuscation
- Lab 6: IoT Security and Wireless Exploitation



Course Labs

- Lab 7: Firewalls and Intrusion Detection Systems (IDS)
- Lab 8: Heartbleed Attack Lab
- Lab 9: Dirty COW Attack
- Lab 10: RSA Public-Key Encryption and Signature
- 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

- Will explain in separated slides soon



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: Secure Coding and Format-String Vulnerability	60
Lab 4: Scanning, Reconnaissance, and Penetration Testing	60
Lab 5: Reverse Engineering and Obfuscation	60
Lab 6: IoT Security and Wireless Exploitation	60
Lab 7: Firewalls and Intrusion Detection Systems (IDS)	60
Lab 8: Heartbleed Attack Lab	60
Lab 9: Dirty COW Attack	60
Lab 10: RSA Public-Key Encryption and Signature	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 by the university

A+	97 - 100%	C+	77 - 79%
A	93 - 96%	C	73 - 76%
A-	90 - 92%	C-	70 - 72%
B+	87 - 89%	D+	67 - 69%
B	83 - 86%	D	63 - 66%
B-	80 - 82%	D-	60 - 62%
F	0 - 59%		



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.



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:
 - <http://cse.sustech.edu.cn/faculty/~zhangfw/20fa-cs315/index.html>
- Instructor homepage:
 - <http://cse.sustech.edu.cn/faculty/~zhangfw>



Lab Session

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