ECE590
Computer and Information Security

Fall 2018

Introduction and Course Policies

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Instructor and TAs

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  - Office Hours: see course site
- Teaching Assistants:
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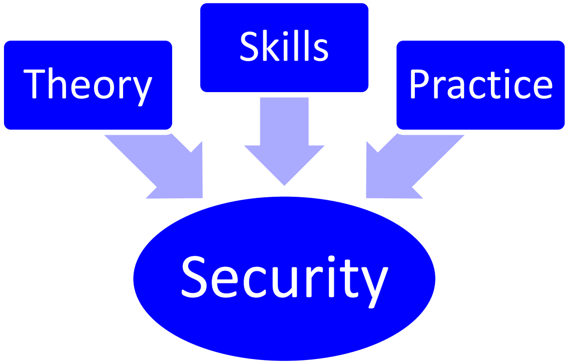
Course objective:
Evolve your understanding of security

- **Theory**:
  - How do I think systematically about security?
  - What constructs are available for me to use?
  - How do I understand *new* threats and defenses not covered in the course?
- **Skills**:
  - What tools are commonly used to do the above?
  - How can I manipulate data and automate things to make the above practical?
- **Practice**:
  - "Stick time": Actually doing it.
  - Both attacking and defending.



Getting Info

- **Course Web Page**: static info

➡ http://people.duke.edu/~tkb13/courses/ece590-sec/

  - Syllabus, schedule, slides, assignments, rules/policies, prof/TA info, office hour info
  - Links to useful resources

- **Piazza**: questions/answers
  - Post all of your questions here
  - Questions must be "public" unless good reason otherwise
  - **No code or copyable answers** in public posts!

- **Sakai**: just assignment submission and gradebook

Textbook

- Text: **Computer Security: Principles and Practice (4th Edition)**, by Stallings & Brown
  - Get the **GLOBAL EDITION**, it's the EXACT SAME BOOK for cheaper.
- The course uses the textbook highly out-of-order, see course site for readings.

ISBN 0-13-479410-9

exact same content!

ISBN 1-292-22061-9

If you go to **addall.com**, you can search all online booksellers at once.

Workload

- Homework assignments – **discussed collaboratively, done individually**
  - Pencil and paper problems
  - Programming problems
  - Technical exercises
  - Attack and defense scenarios
  - Data manipulation and automation tasks

  - *Security is broad and diverse field →*
    Lots of different things to practice →
    Lots of work!!

****Some* collaboration is allowed***

ALLOWED: Collaboration on *approach* or *concepts*.
DISALLOWED: Collaboration on *answers*.

All artifacts you submit must be entirely your own.

Grading Breakdown

HW0! ❗

Assignment	%
Homeworks	60%
Exam 1	10%
Exam 2	10%
Final Exam	20%

Partial credit is available – provide detail in your answers to seek it!

Late homework submissions incur penalties as follows:

- Submission is 0-24 hours late: total score is multiplied by 0.9
- Submission is 24-48 hours late: total score is multiplied by 0.8
- Submission is more than 48 hours late: total score is multiplied by the Planck constant (in J·s)

$\sim 6.6\times 10^{-34}$

NOTE: If you feel *in advance* that you may need an extension, contact the instructor.

These assignments are looooooooooong. START EARLY.

Homework Zero

- Due Thursday night
- Designed to get you familiar with UNIX in general and Linux in particular
- UNIX skills are for more than this course – there's a **reason** people use these tools!
- If you're having trouble, post on Piazza and we can help you.

This is the same Homework 0 sometimes given in ECE/COMPSCI 250.

If you've already done it there, you don't need to do it again – just submit the screenshot from the training system.

Grade Appeals

- All regrade requests must be in writing to the TA

- After speaking with the TA, if you still have concerns, contact the instructor

- All regrade requests must be submitted no later than 1 week after the assignment was returned to you.

Academic Misconduct

- Academic Misconduct
  - Refer to Duke Community Standard
  - Homework content is individual – you do your own work
  - Common examples of cheating:
    - Copying and rephrasing written answers from another student
    - Using code or answers from an outside source
- I will not tolerate any academic misconduct!

- "But I didn't know that was cheating" is not a valid excuse

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Goals of This Course

- Things you will understand after this course:
  - Fundamental security objectives: **Confidentiality, Integrity,** and **Availability**
  - How to develop and describe a **threat model**
  - The types of **security threats and attacks** that must be dealt with
  - How to distinguish among various **types of intruders** and their behavior patterns
  - The **poor programming practices** that cause many security vulnerabilities
  - Major **networking protocols, standards, and tools**
  - **Symmetric and asymmetric cryptography** including message authentication
  - **User authentication**
  - How to reason about and implement **security policies**
  - How to secure **operating systems, databases, hypervisors,** and **cloud environments**
  - The role of **firewalls, intrusion detection,** and **intrusion prevention systems**
  - Security **auditing** and **forensics**
  - **Social engineering** attacks
  - **Ethical and legal aspects** of security

Our Responsibilities

- The instructor and TA will…
  - Provide lectures/recitations at the stated times
  - Set clear policies on grading
  - Provide timely feedback on assignments
  - Be available out of class to provide reasonable assistance
  - Respond to comments or complaints about the instruction provided

- Students are expected to…
  - Receive lectures/recitations at the stated times
  - Turn in assignments on time
  - Seek out of class assistance in a timely manner if needed
  - Provide frank comments about the instruction or grading as soon as possible if there are issues
  - Assist each other *within the bounds of academic integrity*

Computing resources

- We’ll make extensive use of VMs from the Duke Virtual Computing Manager: https://vcm.duke.edu/
  - Students in this course will have their VM limit raised to 4
  - These VMs have public internet IP addresses – practice good security!
- Later, you will be given access to VMs running Kali Linux (a distribution of Linux with many security tools pre-installed)
  - Take care of these – if you blow one up, IT has to rebuild it.
- We will use shared target machines from time to time
  - Treat these with respect – unless otherwise noted, you should ONLY do the prescribed actions to them. Do not “attack” systems you are not explicitly told to.

Ethics in Security

- There are three flavors of security practitioner in the world:
  - **White hat**: Obey the law, work to make systems secure
  - **Black hat**: Break the law, infiltrate (usually for profit)
  - **Grey hat**: Does both (so still super unethical)
- There is ONE flavor of security practitioner in this course:

- All students must sign and turn in an **ethics pledge** in order to receive credit on any assignments (see course site!)