Syllabus for Winter'20 CIS 433/533: Computer & Network Security

I. Course Information

- Prerequisites: CIS 415 (Operating Systems)
- Class time: T R 12:00–13:20 PM (Jan 6 – Mar 13, 2020)
- Classroom: 166 Lawrence
- Instructor: Prof. Jun Li (`lijun@cs.uoregon.edu`)
- TA: Samuel Mergendahl (`smergend@cs.uoregon.edu`)

II. Course Description

As both a science and an art, computer and network security has become one of those must-learn disciplines. Research in computer security has also exploded in response to increasing dependence on critical computer infrastructure and increased exposure to computer threats through the networks.

This course will be comprehensive, covering both fundamental security topics and practical solutions. Yet, it is designed to be manageable for effective learning. Twenty lectures over ten weeks are designed for this class. Here are sample topics (each with a sample question):

- Elementary cryptography (what is the difference between classic cryptography and public-key cryptography?)
- Program security (why virus/worm/Trojan horses are rampant on computer and networks?)
- Protection in general-purpose operating systems (what is access control of memory/address/file/user account?)
- Designing trusted operating systems (can virtualization or layered design help secure an OS?)
- Security in networks (can a firewall deal with all network security threats?)
- Privacy (Is your email or web visits protected with good privacy?)
- Administering security (how to conduct risk analysis and design your security policies?)
- Legal and ethical issues in computer security (now that we catch an attacker, so what?)

III. Textbook

Security in Computing, 5th edition, by Charles P. Pfleeger, Shari Lawrence Pfleeger and Jonathan Margulies. ISBN-10: 0134085043.

IV. Lectures (tentative)

Lecture#	*Chapters*	*Coverage*	*Projects*
1	1.1–1.7	syllabus; introduction	
2	2.1–2.2	authentication and access control `NETSEC reserch overview`	
3	2.3	elementary crypto	
4	2.3	use of encryption;	proj. proposal due; `proj. idea presentation`
5	3.1	program security (1)	
6	3.2–3.3	program security (2)	
7	5.1–5.2	operating systems security (1)	
8	5.2–5.4	operating systems security (2)	
9	6.1–6.3	network security (1)	
10	6.4–6.5	network security (2)	proj. midterm report due
11	6.6	network security (3)	
12	6.7–6.10	network security (4)	
13	-	`Midterm`	
14	8.1–8.6	cloud security	
15	10.3/4;11.1–7	incidents, risk, legal issues and ethics	
16	9.1–9.7	privacy	proj. poster draft version due
17	-	emerging topics	`proj. and poster presentations`
18	13.1–13.4		`proj. and poster presentations`
19	-	`Course review`	proj. poster due
20	-	-	`proj. poster open house`
-	-	-	proj. report due on 3/14

V. Student Workload

The workload of this course is expected to be as follows.

- Class participation. Students should actively participate in the class, including raising questions and participating discussions. Laptop or hand-held device usage is forbidden; if you need them to take class notes, please let me know.
- Course review and homework.
  - Students should carefully review the class materials after the class.
  - There will be approximately **3-4** homeworks throughout the term. **No late submission will be considered.**
  - **CIS 533 students may also need to review no more than three papers, and write a reading summary of each.**
- Class project. **Every** student is required to work on a class project. For CIS 533 students, you are expected to work by yourself. For CIS 433 students, you are recommended to form a team of 2 or 3 students. With the help of the instructor, the student will identify an interesting problem related to the course material, design and evaluate a solution, and write a **project report** and deliver a **poster**.
  Warning: The class project can be a lot of fun, but can be also time-demanding. **Start ASAP.**

VI. Grading Policy

- Overall:
  Class participation 10% Homework 20% Class Project 40% Exam 30%
- For class project:
  Proposal and idea presentation 20% Midterm report 20%
  Final report and presentation 45% Poster design and presentation 15%

VII. Scheduling

- Midterm: Feb. 18, 2020.
- Final: No Final Exam.
- Due dates related to projects: See the table above, due *before* the corresponding lecture begins.

VIII. Outside Classroom Communication

I encourage everyone to get in touch with me or our TA when you have a question. You should fully exploit the office hours! Do not postpone your quesitons until the last couple weeks of the term.

- Instructor office hour: **Tuesdays 2:30 PM – 3:30 PM**. Deschutes 362.
- TA office hours: **Mondays 4-5 PM, Thursdays 4-5 PM.** 1600 Millrace Dr, Suite 200, Rm 260.

Your email subject should begin with **CIS 433:** or **CIS 533:** to help email filtering.

IX. Academic Misconduct

UO policy requires reporting all suspected incidents of academic misconduct to the UO Dean of Students Office of Student Conduct and Community Standards: https://dos.uoregon.edu/academic-misconduct

Students determined to be in violation of the UO student conduct code by the UO Office of Student Conduct and Community Standards will be assigned a failing grade for the course.

For this course, you must do all the work individually, or with your teammates if working on your class project. The use of sources (ideas, quotations, paraphrases) must be properly acknowledged and documented.

X. Universal Learning Environment

The University of Oregon is working to create inclusive learning environments. Please notify me if there are aspects of instruction or design of this course that result in barriers to your participation.