Advanced Networking and Security

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Course Info	CIS413
Classroom	222 RCKWL(W), 3:30-4:45pm T/TH
Office Hours	2-3:15pm, T/TH and by appointment
Communications Policy	Responses to emails and canvas posts within 36 hours

This Syllabus Provides a General Plan for the Course. Deviations May Be Necessary.

Course Description:

Detailed examination of modern security topics, blending coverage of many of the domains of the CISSP with those of the CEH: Access Control, Network Security, Risk Management, Software Development Security, Cryptography, Architecture, Operations, Business Continuity, Legal/Ethical issues, as well as attack, defense and counter-measure mechanisms.

Students are expected to have a good knowledge of Unix/Linux and Windows including basic commands (at the very least: ls, ifconfig, ping, traceroute, nslookup, lsof, ps, netstat, and make commands) – we will provide you with virtual machines (with docker capabilities) in our private network. You must have an understanding of TCP/IP and protocols. Student will receive significant "hands-on" experience both attacking vulnerable systems and defending their own.

General Objectives:

At the end of the semester, students should be able to…

- Understand the Cyber Kill Chain
- Identify LINUX and Windows vulnerabilities and common security problems
- Configure virtualization (VMWare) and containers (docker) to support security and server flexibility
- Describe and interpret basic security models (Linux and Windows)
- Configure web protocols and caching for security
- Secure web servers from SQL injection and encrypt data during transmission
- Describe and perhaps configure Public Key Infrastructure
- Describe how Kali tools (and others) can be used to probe and help secure systems
- Demonstrate the correct procedures to limit access to specific users, including password policies
- Install and configure a firewall
- Scan networks and perform packet analysis
- Install and configure intrusion detection systems
- Perform real time tracking and interrogate audit logs
- Describe Cross-Site Scripting and configure systems to protect against it
- Understand security performance metrics
- Understand forensic procedures

Books (optional):
CompTIA Security+ Get Certified Get Ahead: SY0-601 Study Guide 4th Edition by D. Gibson
Blue Team Field Manual by Alan White and Ben Clark
Red Team Field Manual by Ben Clark

HONOR CODE: **The CSU Honor code will be strictly enforced in this class. All relevant Federal and state computer crime laws will be strictly enforced. Violations of Federal or state law may result in your prosecution and confiscation of all relevant computer equipment by law enforcement. You will be prosecuted if you violate any laws. Period.**

GRADING:

10?	PlayPosits (videos with questions)	50 pts	50
2	Tests (mid-term and final exam)	75,100 pts.	175
12+	Assignments or Quizzes	10-150 pts. each	875 (approx.)
			1100

Grading will be based on the CSU distribution as embedded in Canvas. There may be some slight deviations from this scale in calculating the final course grades, but such adjustments will always improve a student's grade.

Test Information: Mid-Term (Multiple Choice, Short/Long Answer), Final (Short/Long Answer)

Assignments: The details of these assignments and their due dates will be provided as the semester progresses.

All work turned in for a grade should be done to the same level of quality as would be expected in a professional/work environment. This means that all submissions should be neatly typed, use proper grammar and punctuation, have correct spelling, follow standard writing style guidelines, give credit when material is quoted, used, and/or referenced, etc. (See more detailed explanations below under *Individual Work* and *Professional Standards of Scholarship*). Sometimes use of various media (slides, computer presentation, live video) and tools/techniques (PowerPoint) are recommended.

Late Homework, Missed Tests, etc.: Late work is generally not accepted. All submissions are due on the date specified unless otherwise explicitly noted in class, or via the class discussion or web site. Frequently, it will take some days/time to run the grading script and/or examine systems by hand. Thus, your work must stay available and correct until grading is complete.

There will be NO MAKE-UP TESTS given unless you have a university-approved excuse and contact me BEFORE the test in question is given. Tests and homework will not be excused simply for vacations, etc. Schedule your vacations for after the semester is completely finished.

Academic Integrity & CSU Honor Pledge: This course will adhere to the CSU Academic Integrity/Misconduct policy as found in the General Catalog and the Student Conduct Code.

Academic integrity lies at the core of our common goal: to create an intellectually honest and rigorous community. Because academic integrity, and the personal and social integrity of which academic integrity is an integral part, is so central to our mission as students, teachers, scholars, and citizens, I will ask that you affirm the CSU Honor Pledge as part of completing your work in this course. More details are below…

Individual Work: For work assigned to be done individually (Individual Homework), you should turn in only work that you yourself have done. Work submitted as your own, but which was done all or in part by others, will not receive full credit – in fact, it is likely to receive *no* credit. This is known as plagiarism, and is dealt with very seriously. If you draw on previous work done by others, be sure to give appropriate credit when this is the case[1]. When you are asked to work alone, make sure you do that. Obviously, for group work you will work together and turn in a group product. In short, since you are each unique individuals, I expect to be able to easily tell from the work you submit that you worked independently; collaborative work tends to "jump out" at me because it looks "suspiciously similar" to something I've already seen. Make sure you work independently so that I can easily tell that you have done your own work. A penalty will be assigned to those who submit collaborative work when it was assigned to be done individually. The *minimum* penalty is usually a *ZERO* on the assignment, but University Policy allows for more serious penalties when warranted.

[1] For details see section entitled *Professional Standards of Scholarship*.

Professional Standards of Scholarship: Professional standards of scholarship require that any time an individual relies on another's work, proper credit must be given. This means that any time one directly uses textual material that it must be placed within quotes and referenced properly; other non-textual material must be shown with proper credit given citing the original source of the work. When material is not used in exact form (paraphrased, major ideas relied on or referred to, etc.) it should still be given credit as well, although it is not put within quotes. *Always give credit to ideas or materials that are not yours*[2]. If in doubt, give credit. Violations of these standards are *highly* disapproved of, and appropriate academic action will be taken depending on the situation. Be professional, give credit where it is due, turn in work that is your own, and you will be fine.

IF YOU ARE UNCERTAIN ABOUT HOW TO DEAL WITH THESE ISSUES, PLEASE TALK WITH ME. I AM HERE TO HELP YOU LEARN AND TO HELP YOU WHEN YOU ARE UNCERTAIN ABOUT WHAT TO DO. DO NOT HESITATE TO ASK QUESTIONS!

Besides expecting professional standards of scholarship, generally accepted U.S. standards for written work will applied to documents turned in for this course. This means that grammar, punctuation, spelling, and citation of references should follow standard guidelines. APA (American Psychological Association) or another common standard is acceptable for work submitted for this course. Be consistent; be neat; be professional.

You are receiving a degree from a strong U.S. university, which you and the University want to be well-respected. Thus, you will be held to relevant U.S. academic standards.

Participation: While participation is not directly taken into account when determining course grades, it is expected both during class lectures, via e-mail, during online discussions, etc. This course may involve new ideas and almost certainly requires learning new skills and behaviors with respect to your software development habits. Thus participation in class is anticipated to be beneficial and full involvement is expected.

Announcements, Schedule Changes, & Distribution of Assignments, Etc.: **You** *are responsible* for all announcements and any schedule changes made in class — even if you were not at class. Find out from your friends/classmates if there were announcements when you were not present!

Fall 2021 Schedule and Current Assignments

http://selfsynchronize.com/hayne/security/ScheduleFall2021.htm
http://selfsynchronize.com/hayne/security/Assignments.htm

Important information for students: All students are expected and required to report any COVID-19 symptoms to the university immediately, as well as exposures or positive tests from a non-CSU testing location.

If you suspect you have symptoms, or if you know you have been exposed to a positive person or have tested positive for COVID, you are required to fill out the COVID Reporter (https://covid.colostate.edu/reporter/). If you know or believe you have been exposed, including living with someone known to be COVID positive, or are symptomatic, it is important for the health of yourself and others that you complete the online COVID Reporter. Do not ask your instructor to report for you. If you do not have internet access to fill out the online COVID-19 Reporter, please call (970) 491-4600. You may also report concerns in your academic or living spaces regarding COVID exposures through the COVID Reporter. You will not be penalized in any way for reporting. When you complete the COVID Reporter for any reason, the CSU Public Health office is notified. Once notified, that office will contact you and, depending upon each situation, will conduct contact tracing, initiate any necessary public health requirements and notify you if you need to take any steps.

For the latest information about the University's COVID resources and information, please visit the CSU COVID-19 site: https://covid.colostate.edu/.

[2] This includes software source code as well. Always give credit when you rely on someone else's ideas, examples, algorithms, source code, etc.