Spring 2020

IT 230-102: Computer Systems Security

Arnold Felberbaum

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Course Description

IT 230 introduces the applied topic of Computer Security. Students will learn ways of preventing, identifying, understanding, and recovering from attacks against computer systems. It also presents the evolution of computer security, the main threats, attacks and mechanisms, applied computer operation and security protocols, main data transmission and storage protection methods, cryptography, network systems availability, recovery and business continuation procedures. The prerequisite is IT120, Introduction to Network Technology.

Upon completion of this course, students will:

- Have a sound understanding of computer system vulnerabilities and threats, and ways to mitigate them to protect computers against attacks
- Design, develop and implement a computer information security strategy

The textbook addresses all of the objectives of the CompTIA Security+ Certification Exam. The purpose of the course is not to prepare you for the exam, and you are not required to take it. However, you may be able to pass the exam with some extra preparation.

All students **must not** use their smartphone during class. Electronic distractions will interfere with your ability to participate in class and will impact your class participation score. I will provide periodic breaks during class that will allow you time to "catch up" on your digital interactions. Of course, from time to time, you may have that occasional call regarding a personal or work situation that needs your immediate attention. You may accept these calls and leave the classroom. More than one warning during class may result in being marked absent for the class since you are unable to participle in class.

Instructor

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Office Hours: Class Day 4:00 pm – 6:00 pm, by appointment

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Resources

Textbook: CompTIA Security+ SYS-501 Cert Guide Academic Edition, Copyright 2018 by Pearson Education, Inc.

The class web page is on **Canvas** where Notes, assignments, tests, and solutions will be located.

Grading

Your term grade is based on exams, quizzes, homework, and a lab submissions and participation.

Midterm	15%	One 150-point exam
Final	15%	One 150-point exam
Quizzes	15%	2 quizzes, each worth 75 points
Homework	15%	10 homework assignments at 10 points each
Participation	10%	Based on engagement in class (7.5 points based on 13 classes)
Palo Alto Lab points	30%	20 Labs to be completed each worth 15 pts for total of 300

Grades are assigned based on the sum of the points you earn (1000 total points).

A:	Greater than or equal to 911 points
B+	860 – 910 points
B:	800 – 859 points
C+	750 – 799 points
C	700 – 749 points
D	600 – 699 points
F:	0 - 599 points

For example, you may earn an A if you have 900 points and have good class participation. You cannot earn an A without reasonable class participation.

Grades are based solely on the points you earn and are not negotiable.

Exams and Quizzes

The midterm will be during a regular class period. The final exam will be during finals week. The final is not cumulative and covers the material from the midterm until the end of the course. Quizzes will be given during class and will last about 60 minutes. The purpose of the quizzes is for you to assess your readiness for the midterm and final. Make-up exams and quizzes will not be given unless there is a reason beyond your control.

Exams and quizzes will be closed book and must be taken in the classroom. I will allow you one 5 1/2X8 1/2 sheet of paper with notes on both sides. Calculators, mobile devices or smart watches are not permitted.

Tests and Quizzes must be completed in the classroom. When you are done with tests, you may leave. When you are done with Quizzes, you may take a break and must return to class and attendance will be taken at the end of class.

Guidelines for labs

Palo Alto Labs are to be completed according to the delivery dates specified. Each lab takes approximately 30 minutes each. You will need to submit the following document for each lab:

1. A full-screen print according to the schedule provided. The screen print must include:
    1. The session id number (you will need that to name the file)
    2. The time left in the session
    3. The date and time of your PC (Windows – lower right, MAC – upper right) must be included
2. Must paste the screen copies in a word document
3. The file name is: Session ID Your last and first name lab #. Example: 123456789 Felberbaum Arnold Lab 1
4. Do not convert to a PDF.

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Class Preparation and Participation

Powerpoint notes and other resources will be available on the class page before each class. I expect you to do the assigned reading and review the notes before you come to class. You will get more out of the class if you have spent some time thinking about the material in advance. This course covers a lot of material quickly. There are 10 questions 15-minute homework assignment due by the following class. Don't let yourself get behind!

Attendance and participation is highly correlated with good performance in the class, so I will record attendance for every class and can affect your grade as follow (more than one warning during class regarding smartphone use will result in no class participation for that class):

- Miss 2 - 6 classes — Up to a 75% participation penalty
- Miss > 6 classes — You cannot receive an A

Absences may be excused for athletics, religious holidays, illness, military obligation, or family emergencies if you contact me before the missed class. Leaving class early with a realistic reason will have an impact on your ability to participate during class. If you need to leave early, please advise the professor.

I expect you to be an active participant in each class.

Homework

Homework is due regularly. Homework problems will be online through Canvas. Solutions will be provided on the class Canvas page.

Unless otherwise specified, homework is due at the beginning of class on the due date. It is automatically graded unless a question requires a detailed answer. Late homework will be accepted with a penalty unless there is a reason beyond your control. Homework is a large component of your semester grade.

Lab Submissions

For each lab, in addition to the required screen prints, you must answer the following questions in complete sentences:

- What is the primary learning objective of this lab?
- Why is this an important function to understand from a security perspective?
- What type of threat is being mitigated?

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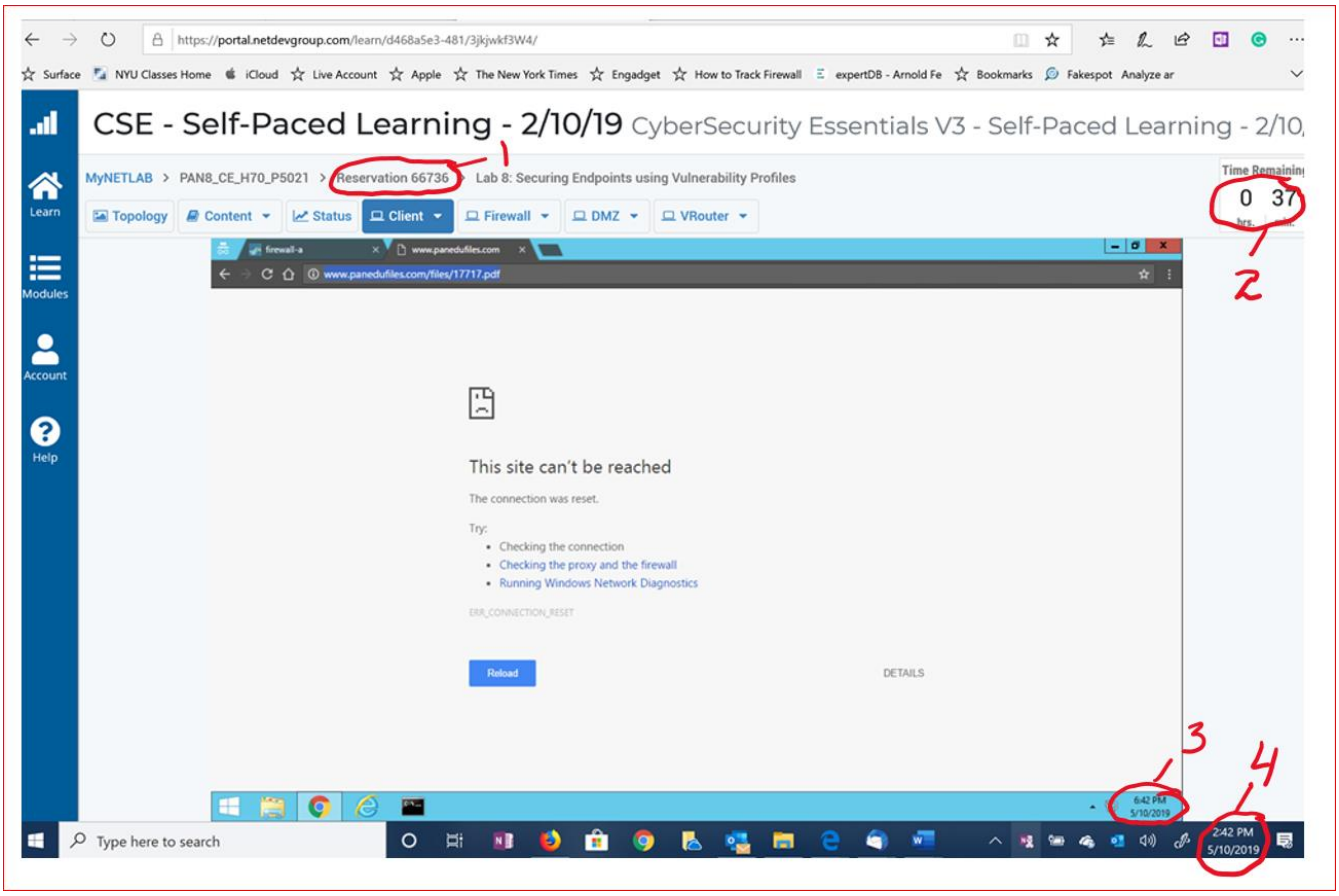
All Labs are to be submitted according to the schedule posted on Canvas. Lab screen submissions consist of several pieces of information, as follows:

Sample:



1 – Reservation Number, 2 – Session time remaining, 3 – Lab Time, 4 Your computer time

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#	Date	Chapters	Deliverables	Subject
1	January 21	1 & 2		**Class Orientation** · Homework · PaloAlto – Logon and Validate · Use of Respondus **Introduction to Security** • Security 101 • Think like a hacker • Threat actor types and attributes **Computer Systems Security Part I** • Malicious software types • Delivery of malware • Preventing and troubleshooting malware
2	January 28	3 & 4	Respondus Verification Quiz CSG Lab 1 CSG Lab 2 CSG Lab 3	**Computer Systems Security Part II** • Implementing security applications • Securing computer hardware and peripherals • Securing mobile devices **OS Hardening and Virtualization** • Hardening operating systems • Virtualization technology

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3	February 4	5 & 6	CSG Lab 4 CSG Lab 5 CSG Lab 6	**Application Security** · Securing the browser · Securing other applications · Secure programming **Network Design Elements** · Network design · Cloud security and server defense
4	February 11	7 & 8	CSG Lab 7 CSG Lab 8 CSG Lab 9	**Networking Protocols and Threats** • Ports and protocols • Malicious attacks **Network Perimeter Security** • Firewalls and network security • NIDS versus NIPS
5	February 18	9	CSG Lab 10 CSG Lab 11	**Securing Network Media and Devices** • Securing wired networks and devices • Securing wireless networks
6	February 25	**Quiz** – Preliminary to Mid-Term Review of Chapters 1-9 for Midterm and Study Guide		
7	March 3	**Mid Term Exam**		

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8	March 10	10 & 11	CSE Lab 1 CSE Lab 2	**Physical Security and Authentication Models** · Physical security · Authentication models and components **Access Control Methods and Models** · Access control models defined · Rights, permissions, and policies
9	March 17	12 &13	CSE Lab 3 CSE Lab 4	**Vulnerability and Risk Assessment** • Conducting risk assessments • Assessing vulnerability with security tools **Monitoring and Auditing** • Monitoring methodologies • Using tools to monitor systems and networks • Conducting audits
10	March 31	14 & 15	CSE Lab 5 CSE Lab 6 CSE Lab 7	**Encryption and Hashing Concepts** • Cryptography concepts • Encryption algorithms • Hashing basics **PKI and Encryption Protocols** • Public key infrastructure • Security protocols

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11	April 7	16 & 17	CSE Lab 8 CSE Lab 9 CSE Lab 10	**Redundancy and Disaster Recovery** • Redundancy planning • Disaster recovery planning and procedures **Social Engineering, User Education, and Facilities Security** • Social engineering • User education • Facilities security
12	April 14	17 &18	CSE Lab 10 CSE Lab 11 CSE Lab 12	**Social Engineering, User Education, and Facilities Security** • Social engineering • User education • Facilities security) **Policies and Procedures** • Legislative and organizational policies • Incident response procedures • IT security frameworks
13	April 21	**Quiz** – Preliminary to Final Review of Chapters 10-18 for Midterm and Study Guide		
14	April 28	**Last class**		
15	May 12	**Final**		

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