IT 4990-40: Special Topics in Cybersecurity

Fall 2023 Syllabus

This course provides the student with a general understanding of how to install, configure, and manage Next Generation Firewalls (NGFW) for defense of enterprise security network architecture. Students will learn the configuration and management steps for setting up the security, networking, accounts, zones, and security policies of next generation firewall technologies. This course is the combination of two PaloAlto courses: Enterprise Security Management (ESM) and Enterprise Security Deployment (ESD) provided by PaloAlto Networks. Check with **Canvas** for updates and assignments.

Prerequisites: IT2400 with a C or better.

Course fee: $20, used to assist in maintaining Computing infrastructure.

One section:

- This is an online course

    - Final exam will be online during the week of December 10th. The final will consist of a multiple choice exam and a capstone project.

Instructor:

- Jay Sneddon
- Office: North Burns 235
- Office hours: MW 12:00pm-12:50pm, TTh 1:30pm-2:20pm or by appointment. Zoom appointments may be arranged.

Objectives

At the end of the course, students will be able to:	Outcome is Measured through
Review industry leading firewall platforms, architecture, and defense capability related to zero trust security models and public cloud security. (IT PLO 1,2,3,4)	Assignments, Quizzes, and Exams
Demonstrate and apply configuration of firewall initial access, interfaces, and security zones. (IT PLO 1,2,3)	Assignments, Quizzes, and Exams
Configure and manage virtual routing, filtering, licensing, service routes, software updates, and policy-based forwarding on next generation firewalls. (IT PLO 1,2,3)	Assignments, Quizzes, and Exams
Analyze security policy administrative concepts related to source and destination network address translation. (IT PLO 1,2,3)	Assignments, Quizzes, and Exams
Outline and construct security policies to identify known and unknown application software running on the service network. (IT PLO 1,2,3)	Assignments, Quizzes, and Exams
Identify how App-ID reduces the attack surface and configure App-ID based policy rules. (IT PLO 1,2,3,4)	Assignments, Quizzes, and Exams
Describe and configure security, file blocking, and DoS protection profiles to mitigate attacks. (IT PLO 1,2,3,4)	Assignments, Quizzes, and Exams
Configure the firewall to block traffic from malicious IP addresses, domains, and URLs. (IT PLO 1,2,3,4)	Assignments, Quizzes, and Exams
Describe WildFire deployment options and configure WildFire updates. (IT PLO 1,2,3,4)	Assignments, Quizzes, and Exams
Identify the main components of User-ID and configure user to group name mapping. (IT PLO 1,2,3,4)	Assignments, Quizzes, and

	Exams
Describe and configure SSL/TLS forward proxy and inbound inspection decryption. (IT PLO 1,2,3,4)	Assignments, Quizzes, and Exams
Monitor threat and traffic information using logs, reports and the firewall ACC. (IT PLO 1,2,3)	Assignments, Quizzes, and Exams

Resources

REQUIRED

The learning material and labs are provided by the Palo Alto Networks Cybersecurity Academy. The labs are hands on exercises using a NGFW.

Some other supplemental online resources may be used.

Computer Resources

It is expected that you have regular access to a computer that is capable of running modern Internet browsers with full access to the Internet.

Course Information

You are responsible for being informed regarding announcements, the schedule, and other resources posted on this website. Grading and assignments are managed at https://utahtech.instructure.com.

Assignments and Exams

Reading

The student is responsible for reading the material found online. A reading schedule is provided with the class schedule on the course website. The student is expected to read the material before the class in which it is discussed. Each module covered has at least one associated hands on lab exercise. Feel free to bring questions from the reading to lectures or to office hours.

Assignments

Assignments will be graded based on completeness.

(See the Late Work policy for more information)

All assignments for the week are due Saturday night at 11:59pm, unless otherwise noted on Canvas.

Exams

At least four exams plus a final exam will be given. Students will be expected to completed the capstone project at the end of the course. Because this is an online course, exams will be provided in either the campus Testing Center or through Canvas using Proctorio as the proctoring agent.

Grading

Assignments, quizzes and exams each contribute to your point total.

Assignments/Labs = 20%

Quizzes = 20%

Exams = 30%

Comprehensive Final Exam = 20%

Capstone Lab = 10%

Here is the grading scale: >= 94 = A >= 90 = A- >= 87 = B+ >= 84 = B >= 80 = B- >= 77 = C+ >= 74 = C >= 70 = C- >= 67 = D+ >= 64 = D < 64 = F

Tentative Topic Schedule

Week of	Module Readings (m=ESM course, d=ESD course	Quiz/Exam, Holidays
Aug 20	01m - Security Architecture Planning	
Aug 27	02m - Configuring and Managing Firewall Interfaces	Quiz (Mod 1m)
Sep 03	03m - Managing Firewall Administrator Accounts	Quiz (Mod 2m)
Sep 10	04m - Connecting Security Zones, Review	Quiz (Mod 3m), **EXAM 1 (Mods 1m,2m,3m)**
Sep 17	05m - Creating and Managing Security Policies	Quiz (Mod 4m)
Sep 24	06m - Creating and Managing NAT Policy Rules	Quiz (Mod 5m)
Oct 01	Review	Quiz (Mod 6m), **EXAM 2 (Ch 1m thru 6m)**
Oct 08	01d - Identify Applications	**Fall Break**
Oct 15	02d - Deploy Security Profiles	Quiz (Mod 1d)
Oct 22	03d - Configure URL Filters	Quiz (Mod 2d)
Oct 29	04d - Contain Malware with Wildfire, Review	Quiz (Mod 3d), **Exam 3 (Mods 1d, 2d, 3d)**
Nov 05	05d - Control Access with User-ID	Quiz (Mod 4d)
Nov 12	06d - Block Encrypted Traffic Threats	Quiz (Mod 5d)
Nov 19	07d - Monitor Logs and Develop Reports	Quiz (Mod 6d)
Nov 26	Review	Quiz (Mod 7d),**EXAM 4 (Mods 4d thru 7d)**
Dec 03	**Capstone Practical**	
Dec 10	Final Exam online	**Comprehensive Final Exam**

This schedule is subject to change.

Course Policies

Absences

Students are responsible for material covered and announcements made. School-related absences may be made up only if prior arrangements are made. The class schedule on Canvas presented is approximate. The instructor reserves the right to modify the schedule according to class needs. Changes will be announced in class and posted to the website. Exams and quizzes cannot be made up unless arrangements are made *prior* to the scheduled time.

Time

Courses should require about 2 hours of outside work per lecture hour of class. This class will require about 6 hours of work per week on the part of the student to achieve a passing or higher grade. Be sure to evaluate your schedule before committing to this course.

Late work

Assignments are due on the date specified in the schedule. Late assignments and make up quizzes will be accepted but penalized 10% per day for five days after the due date, with the maximum penalty being 50% for late work. No work will be accepted after the final exam.

Cheating and Collaboration

Limited collaboration with other students in the course is permitted and encouraged. Students may seek help learning concepts and developing programming skills from whatever sources they have available, and are encouraged to do so. Collaboration on assignments, however, must be confined to course instructors, lab assistants, and other students in the course. See the section on cheating.

Cheating will not be tolerated, and will result in a failing grade for the students involved as well as possible disciplinary action from the college. Cheating includes, but is not limited to, turning in homework assignments that are not the student's own work. It is okay to seek help from others and from reference materials, but only if you learn the material. As a general rule, if you cannot delete your assignment, start over, and re-create it successfully without further help, then your homework is not considered your own work.

You are encouraged to work in groups while studying for tests, discussing class lectures, and helping each other identify errors in your homework solutions. If you are unsure if collaboration is appropriate, contact the instructor. Also, note exactly what you did. If your actions are determined to be inappropriate, the response will be much more favorable if you are honest and complete in your disclosure.

Where collaboration is permitted, each student must still create and type in his/her own solution. Any kind of copying and pasting is *not* okay. If you need help understanding concepts, get it from the instructor or fellow

classmates, but never copy another's written work, either electronically or visually. It is a good idea to wait at least 30 minutes after any discussion to start your independent write-up. This will help you commit what you have learned to long-term memory as well as help to avoid crossing the line to cheating.

Policy for Absences Related to College Functions

Students may periodically may miss classes for various college-related functions or military functions; these include athletics, club events, or to fulfill the requirements of a course or a program. Military functions may include: Reserve and Guard activation, activation, special assignments or other approved events or activities. These absences may often conflict with the instruction, assignments, and tests in this course.

Please provide an advanced written notification from your activity supervisor that explains the nature of the activity, and the anticipated time missed.

Disruptive Behavior Policy/Classroom Expectations

The classroom needs an atmosphere of learning and sharing. Class members need to feel safe and able to concentrate. Disruptive behavior that seriously detracts from this environment or inhibits the instructor's ability to conduct proper instruction will not be allowed. Disruptive behavior includes:

- Physical violence, verbal abuse, or harassment
- Intoxication or illegal drug use
- Use of profanity
- Failing to respect others when expressing their own viewpoints
- Talking while the instructor or another student is talking
- Constant questions or interruptions that interfere with classroom presentation

Disruptive class members will be warned. Continued misbehavior may lead to dismissal from class or the course. If necessary, Campus Police may be called.

Disability/Accessibility Resources

Utah Tech welcomes all students and strives to make the learning experience accessible. If you are a student with a medical, psychological, or learning disability that may require accommodations for this course, you are encouraged to contact the Disability Resource Center (DRC) as soon as possible. You may request reasonable accommodations at any time during the semester; however, they are not retroactive. The DRC is located next door to the Testing Center in the North Plaza Building (435 652-7516, drc@utahtech.edu, drcenter.utahtech.edu).

University Policies

OTHER UNIVERSITY SUPPORT SERVICES

NAME	SERVICE
Utah Tech Resources Overview	Visit this site to see many student resources in one place.
Academic Advisement	Helps students make decisions about their courses and degree path.
Academic Performance and Tutoring Center	Offers one-on-one tutoring, study hall, and online tutoring to help students in many subjects ranging from Math to Foreign Language.
Booth Wellness Center	Provides acute health care, referral services, health education, and brief mental health services.
Campus Life	The Utah Tech University Student Association offers a variety of ways to get involved socially at the university.
Career Services	Assists students with career exploration, choosing a major, writing a resume, and getting a job.
Center for Inclusion & Belonging	Increases diversity through scholarship opportunities, community outreach, academic advisement, and diversity club participation.
Dean of Students Office	Serves as a primary advocate and support network for students. Assists students who are facing personal challenges, including financial, food, and housing concerns.
Disability Resource Center	Serves students with disabilities by providing equal access to academic programs, non-academic activities, and campus facilities
DRC Accessibility	A list of DRC services including exam accommodations, ASL interpreting, materials in alternative format, and more.
	Provides assistance for Canvas, Student Email, Student Services, Trailblazers wireless

Help Desk	configuration, laptop assistance, and any other technical troubleshooting you may need help with.
Library	Provides the resources necessary to facilitate research and enhance university curriculum and programs.
Math Tutoring Center	Students can drop in to work on homework, take tests, and receive individualized or group tutoring. Online tutoring is also available.
Student Support Services	Provides a variety of free services to help first-generation, low-income, or students with disabilities to complete an associate degree and move on to a bachelor degree.
Testing Center	Provides all proctored exams on campus and can make accommodations for remotely proctored exams.
Utah Health Scholars	Provides tutors for upper-division, health-related courses. Students must register into the UHP program to qualify for this free tutoring.
Veterans Services	Offers tutoring for some classes and arranges tutoring in other centers for other classes. Must have VA benefits to qualify.
Writing Center	Offers students personalized attention from tutors for writing.

UTAH TECH POLICIES & STATEMENTS

PRIVACY

It is your responsibility to protect your data and privacy online. Be careful and use discretion when using any of the course technologies to complete required learning activities. If you are unsure about how to protect your data and privacy online, please use the resources provided to understand your responsibility.

101 Data Protection Tips: How To Keep Your Passwords, Financial, and Personal Information Safe

Harper, E. (2018). 9 Simple Ways To Protect Your Privacy

Canvas Privacy Policy

Google Privacy Policy

YouTube Policies

Vimeo Privacy Policy

Utah Tech Policy Links

Code of Student Rights and Responsibilities (Academic dishonesty / academic integrity policy, student academic conduct policy)

Financial Aid

Registration

Student Association

Student absence related to college function

Sexual Harassment

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TITLE IX STATEMENT

Utah Tech University affirms its commitment to the promotion of fairness and equity in all aspects of the educational institution. Harassment and discrimination—including sex/gender discrimination, gender identity, gender expression, sexual harassment, sexual misconduct, gender-based violence, dating violence, domestic violence, stalking, pregnancy or parental , family or marital status and or retaliation—not only disrupts our commitment to maintaining an environment in which every member of the University community

is treated with respect and dignity, but may also violate University policy and federal, state, and/or local law.

Should you or someone you know experience behavior that is coercive, discriminatory, harassing, and or sexually violent in nature, or if you or someone you know has questions about their rights and options regarding such behavior, you are encouraged to contact:

Title IX Coordinator 435.652.7747 (ext. 7747)

Incidents may also be reported directly to law enforcement, either separately or in conjunction with any report made to the University's Title IX Coordinator, and the University will aid in making contact if requested.

Utah Tech University Police 435.275.4300 or by calling 9-1-1

Maintaining a safe and inclusive University community is a shared responsibility. For more information on how Title IX protections can benefit you and help us keep a productive campus environment, visit titleix.utahtech.edu to learn more.

STUDENT EMAIL

You are required to frequently check your university email account. Important class and university information will be sent to your university account, including Utah Tech bills, financial aid/scholarship notices, notices of cancelled classes, reminders of important dates and deadlines, and other information critical to your success at Utah Tech and in your courses. To access your university-sponsored account, visit helpdesk.utahtech.edu/about-dmail. Your username is your digital ID (e.g. D00111111).

NON-STUDENT

Non-student in the classroom and other designated study areas: It is expected that only bona fide students as defined and classified by the Utah Tech University catalog, will attend classes, unless specific prior permission for guests has been obtained from the instructor.

ACADEMIC GUIDELINES REGARDING COVID-19

For Utah Tech's up-to-date COVID-19 Emergency Response Plan, please visit the university website.