West Texas A&M UNIVERSITY

School of Engineering, Computer Science and Mathematics

SYLLABUS

Revised 09/03/18

Course number and Course Title: CS 4360 Approaches to Internet and Computer Networks Security

Instructor: Heath Patterson

Semester: Fall 2019

Contact Information and Office Hours –

Instructor:	Heath Patterson
Email:	use only email from within WTClass
Office:	None
Office Phone:	None
School of ECSM Phone:	(806) 651-5257
Office Hours:	None

Texts and Other Materials –

Required Texts:

The Practice of Network Security Monitoring: Understanding Incident Detection and Response 1st Edition, Richard Bejtlich , No Startch Press
ISBN-13: 978-1593275099
ISBN-10: 1593275099

Recommended Texts:

The Linux Command Line Third Internet Edition, William Shotts, A LinuxCommand.org Book

Other Required Materials:

- **High speed internet access**. This is provided for you if you work in the ECS 142 lab using the computers provided to support your work. If working on your own computer, you definitely will need high speed access to the Internet. All assignments, etc. will be posted on WTClass. You will be completing some assignments via remote SSH access.

- **Linux distro**. This can be a virtual machine run in Virtualbox. I recommend that you download the Security Onion.

Course Description and Purpose–
This course is intended for students to gain knowledge essential to computer network security in wired and wireless network topologies, including authentication, encryption and server side protection. Packets, TCP/IP, UDP, ports, Internet topology, IP addressing scheme and DNS. Hands-on security breeches will be presented and practices implementing security in a local area network (LAN).

Prerequisite: CS 3372 or Consent of Prof. Haiduk. It is also assumed you CAN and WILL read supporting materials including this syllabus.

Considerations Regarding Class as a "Hybrid" –
A hybrid class is one that combines the characteristics of an online class with a traditional face-to-face class. The following characteristics for this hybrid class may help you better understand the concept.

- Heavy use of a content management system. For example WTClass will be used to post assignments, publish content, communicate with students, publish grades, etc.
- Face-to-face sessions will focus on both content and hands-on activities.
- Class will meet instructor/student face-to-face at least 50% of the time. However, students should plan to meet at the scheduled class time for team meetings, etc. This time is on your schedule; thus, there should be no conflicts or acceptable reasons for missing these sessions

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Objectives/Student Learning Outcomes:
Upon successful completion of this course, the student will be able to complete all the listed learning objectives with a minimum of 70 percent competency level based on required exams and faculty evaluation. The student will demonstrate the following competencies by designing, implementing, and testing various computer network security tools and concepts. The successful student will be able to:

- Demonstrate a knowledge of network classes and network boundaries
- Demonstrate an understanding of difference types of networks and network defenses
- Navigate through through tools which are critical to network security
- Show where security tools and controls should be placed
- Design a concept for providing security for a computer network system

Program Learning Outcomes:

Computer Science Program Outcomes:
Students completing the Computer Science curriculum will be able to demonstrate:

- **A system-level perspective;**
- **An appreciation of the interplay between theory and practice;**
- **Familiarity with common themes of computer science such as abstraction, complexity and evolutionary change; and**
- **Adaptability to the enormous pace of change in computing.**

All four items are addressed by this course.

Course Requirements and Evaluation –

Explanation of Assignments and Requirements

The final course grade will be determined as follows (percentages may change):

• Major Labs (ten or more)*	50 %
• Other Assignments (ten or more)	10 %
• Major Exams (two)	25 %
• Final Exam**	15 %
	100 %

Standards:

- A: 90+ **and on-time submission of ALL assigned work, quizzes and exams**
- B: 80 to < 90
- C: 70 to < 80
- D: 60 to < 70
- F: < 60

*NOTE: Timely submission of ALL work is essential to successful completion of this course.
****Failure to take the final results in an automatic F for the course.**

Policy for Submission of Assignments: All work for this course will be submitted electronically. Requirements for all assignments will include a precise date and time after which work will NOT be accepted. It is your responsibility to make your submissions prior to the deadline. Ensure that you begin your submission early enough to make the deadline. NOTE: the precise time for closing submissions is maintained by the server to which the submissions are made. These servers' clocks are set precisely by use of network time servers.

No Food or Drink in Classroom: Classes are conducted in a computer lab with some very expensive computers. Grease and liquids are NOT compatible with this equipment. Thus, consume your food and beverage **before** coming into the classroom. If you have been eating, it is preferred that you wash your hands thoroughly with soap before beginning to use the computers.

Reading Text and All Supporting Materials: It is assumed you CAN and WILL read the textbook and all supporting materials including this syllabus.

Additional expectations are that you:

- dress as an aspiring professional, particularly dress in such a way that your dress, or lack thereof, does not disrupt work of the class – this means removing caps/hats and hoods so that you demonstrate courtesy to your classmates. Also, no cracks front or back.
- regularly check (at least three times a day) your "official" University email box for messages from your professors, the business office, the registrar's office, etc. Create an e-mail filter for **CS4360** in the subject line and have course mail placed in a separate folder.
- push monitors all the way down and turn them off except during those times when work with computer is a part of the class session
- attend ALL the class sessions ON time, and stay until the end of the class meeting .

. . **repeated late arrival is inexcusable and inconsiderate and WILL have a negative impact on your grade.**

- (while in class sessions) be attentive to discussion at hand and NOT surfing the Web, working on an assignment in another class, or engaged in sidebar discussions with other classmates . . . such behavior demonstrates a lack of common civility and courtesy to your classmates and professor
- (while in class sessions) turn off all smart watches, cell phones, PDAs, beepers, etc. unless you have informed the professor that you are, for example, an EMT or a firefighter on call, or that you are waiting for a personal emergency call
- submit ALL work by the date and time specified – failure to do so will result in the grade of 0 for the submission in question
- be committed to daily work for this class – chances for success are greatly enhanced by sticking to this
- be committed to completing all homework assignments, all quizzes, all exams and any other work during the time(s) allotted for such
- be interested in learning rather than just finishing a given assignment, the course, or your degree
- arrange your schedule so that you have ample time for the work in this course -- an average of 10 - 15 hours a week outside of class, including some more time to allow for unexpected problems
- read assigned material thoroughly, including tracing examples and working through exercises (whether assigned or not)
- regularly generate questions, and ask them, on material you don't understand
- participate in any forums in an informed, professional manner
- devote regular time to studying NOT to just doing assignments
- start and finish assignments promptly
- follow assignment specifications carefully
- take pride in the work you turn in, including doing a final careful check for completeness and correctness
- identify your academic weaknesses and work on them and/or come for help
- abide by the rules of the course, the ECSM School, and the University
- scrupulously follow academic integrity standards, including doing individual work when specified (without human or other sources of help) attend all group meetings, if group projects are assigned, and contribute significantly to group work

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Academic Integrity –

All work must be completed individually unless otherwise stated. Commission of any of the following acts shall constitute scholastic dishonesty: acquiring or providing information for any assigned work or examination from any unauthorized source; informing any person or persons of the contents of any examination prior to the

time the exam is given in any subsequent sections of the course or as a makeup; plagiarism; submission of a paper or project that is substantially the same for two courses unless expressly authorized by the instructor to do so. For more information, see the http://www.wtamu.edu/studentcode/.

The first instance of like or substantially like submissions of any assignment/take-home exam by two or more students not working together in an approved group will result in the grade of zero (0) for the assignment or take- home exam for each participant submitting the like work. The second instance of like or substantially like submissions of a programming assignment/take-home exam will result in the grade of zero (0) for the assignment/take-home exam for each participant submitting the like work AND initiation of disciplinary proceedings.

ADA Statement –

West Texas A&M University seeks to provide reasonable accommodations for all qualified persons with disabilities. This University will adhere to all applicable federal, state and local laws, regulations and guidelines with respect to providing reasonable accommodations as required to afford equal educational opportunity. It is the student's responsibility to register with (SDS) and to contact faculty members in a timely fashion to arrange for suitable accommodations. Contact Information: Student Success Center, CC 106; phone (806) 651-2335.

Acceptable Student Behavior –

Classroom behavior should not interfere with the instructor's ability to conduct the class or the ability of other students to learn from the instructional program (*Code of Student Life*). Unacceptable or disruptive behavior will not be tolerated. Students engaging in unacceptable behavior may be instructed to leave the classroom. Inappropriate behavior may result in disciplinary action or referral to the University's Behavioral Intervention Team. This prohibition applies to all instructional forums, including electronic, classroom, labs, discussion groups, field trips, etc.

In order to create a smooth and harmonious learning community, it is important that EVERY student understand the expectations for conduct and engage completely in the experience. Thus, you are expected to adhere to the Association for Computing Machinery (ACM) Code of Ethics which includes (among other items) the following behaviors:

- contribute to society and the well-being of others
- avoid harm to others
- be honest and trustworthy
- honor property rights including copyrights and patents give proper credit for intellectual property
- access computing and communication resources only when authorized to do so
- respect the privacy of others
- honor confidentiality
- give serious thought to the potential consequence of any behavior associated with computers, networks or entire systems

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Evacuation Statement –

If you receive notice to evacuate the building, please evacuate promptly but in an orderly manner. Evacuation routes are posted in various locations indicating all exits, outside assembly area, location of fire extinguishers, fire alarm pull stations and emergency telephone numbers (651-5000 or 911). In the event an evacuation is necessary: evacuate immediately. Do not use elevators; take all personal belongings with you; report to outside assembly area and wait for further information; students needing assistance in the evacuation process should bring this to the attention of the instructor at the beginning of the semester.

Copyright Statement –

Topics Covered Include

Topics to be covered include:

- Overview of Network and Networking concepts
- Firewall fundamentals
- Intrusion Detection Systems
- Encryption Fundamentals
- Defending against malware
- Security Policies

TIPS FOR DOING WELL IN COURSE:

- Students should do all the assigned work and make timely submissions for those assignments requiring a submission. This means that the payoff in knowledge and grades is directly proportional to a consistent and timely approach to the work for this course.
- Start working on assignments the day they are posted. Most students grossly underestimate the time required to do quality work in this course. Assignments get progressively more difficult as the course progresses. It is not unusual for some of the assignments to require 10 to 20 hours to complete.
- Pay attention in class. Avoid the temptation to surf the web, engage in online games, etc.
- Do all work on your own. If you steal the work from any other source, you are demonstrating a significant lack of academic integrity. The course will be presented with the fundamental assumption that students are enrolled because they want to learn, not because they are looking for an easy grade.