Firewall and Intrusion Detection Systems: COSC 4367.001
School of Engineering and Computer Science
Fall 2022

A. COURSE INFORMATION

Course number/section: COSC-4367.001
Class meeting time: MW 2:00 – 3:15 pm
Class location: BH 202
Course Website: bb9.tamucc.edu

B. INSTRUCTOR INFORMATION

Instructor: Jacob D. Hopkins, M.S.
Office location: CI 346
Office hours: MW 3:30 – 4:30 pm
Telephone: 361-244-6019
e-mail: jhopkins2@islander.tamucc.edu
Discord: JHopkins#6288
Appointments: By e-mail

C. COURSE DESCRIPTION

Catalog Course Description
This is an applied course which focuses on the standards and technologies used to establish inter-network structures that will support a TCP/IP data stream for higher-level services to operate over. This course introduces firewalls, Intrusion Prevention Systems (IPS), and Intrusion Detection Systems (IDS) technology. Topics include Windows, Linux, Check Point and Cisco firewalls, TCP/IP and open system interconnection (OSI) models, attack traffic analysis, and network-based and host-based hardware and software. Device configuration will be examined and evaluated with appropriate exercises.

D. PREREQUISITES AND COREQUISITES

Prerequisites
COSC 3372 – Network Security, and COSC 4365 – Windows Security

E. REQUIRED TEXTBOOK(S), READINGS AND SUPPLIES

Required Textbook(s):

- Linux Firewalls: Attack Detection and Response with iptables, psad, and fwsnort: By Michael Rash, ISBN-13: 978-1-59327-141-1.

Supplies
Computer and VMware

F. STUDENT LEARNING OUTCOMES AND ASSESSMENT

Assessment is a process used by instructors to help improve learning. Assessment is essential for effective learning because it provides feedback to both students and instructors. A critical step in this process is making clear the course's student learning outcomes that describe what students are expected to learn to be successful in the course. The student learning outcomes for this course are listed below. By collecting data and sharing it with students on how well they are accomplishing these learning outcomes students can more efficiently and effectively focus their learning efforts. This information can also help instructors identify challenging areas for students and adjust their teaching approach to facilitate learning.

By the end of this course, students should be able to:

1. Evaluate the effectiveness of firewalls.
2. Evaluate effective Intrusion Prevention Systems (IPS) and Intrusion Detection Systems (IDS).
3. Mastery of packet analysis
4. Understand how to effectively apply and deploy technologies and administrative tools in an organizational environment.

G. INSTRUCTIONAL METHODS AND ACTIVITIES

Instructional methods will consist of lectures, in-class exercises, quizzes, and homework assignments. Assessment of objectives will be conducted through exams, quizzes and homework assignments. Regular completion of all reading, in-class exercises, homework, and other outside assignments are essential for success in this course.

H. MAJOR COURSE REQUIREMENTS AND GRADING

Your course grade will be decided on your performance in the homework assignments, quizzes, and exams. The distribution of points is as follows:

ACTIVITY	% of FINAL GRADE
Exams	50
Quizzes	20
Assignments/Labs	30

Grading scale: A: 100-90, B: 89-80, C: 79-70, D: 69-60, and F: 59-0.

Homework Assignments: Approximately 6-8 homework assignments will be given. Late homework assignments will be accepted at a penalty. Partial credit will be given for incomplete assignments.

Quizzes: Approximately 8-10 quizzes (dropping one or two) will be given. Each quiz is about

10 to 15 minutes long. Each quiz will be announced at least a class day prior to the quiz.

I. TENATIVE COURSE CONTENT/SCHEDULE

DATE	TOPIC	CHAPTER(S)	ASSIGNMENTS
Week 1	Introduction - Linux	1	
Week 2	Iptables, Scripting	1	HW 1
Week 3	Network Layer Attacks and Defense	2	HW 2
Week 4	Transport Layer Attacks and Defense	3	
Week 5	Application Layer Attacks and Defense	4	HW 3
Week 6	IDS/IPS **Exam 1**		
Week 7	IDS/IPS, Snort	9	HW 4
Week 8	Attack Analysis - Wireshark		
Week 9			
Week 10	**Exam 2**		
Week 11			
Week 12			
Week 13			
Week 14			
Week 15			
Final Exam: 12/07/2022 from 1:45 – 4:15 PM			

Note: Changes in this course schedule may be necessary and will be announced to the class by the Instructor. The assignments and exams shown are directly related to the Student Learning Outcomes described in Section F.

J. COURSE POLICIES

Attendance/Tardiness
Success in this course depends on your attendance and participation. There will be in-class demonstrations of various tools and techniques. This class will require you to use those tools and techniques for your assignments, quizzes, and exams; thus, attendance and active participation are essential to successfully complete this course. Attendance to the class will be recorded.

Absence from class
Students are responsible for all materials covered in class and assigned. Should a student be absent from class, it is his/her responsibility to get the noted, etc. for that missed class. More important, should there be assignments, it is the student's responsibility to obtain such

assignments. No excuse will be accepted for assignments not turned in because the student was absent when it was due.

Late Work and Make-up Exams
Late work penalty: 10% of the assignment's points will be deducted for every day that the assignment was late by. So, if the assignment was submitted 5 days late, then 50% of the assignment's total points will be deducted. If the assignment is either late by 10 days or the submitted assignments are being graded, zero credit will be given.

No makeup exam without adequate doctor's excuse explaining your absence. Makeup exams will not be the same exam. If for any reason you have a conflict you must see me as soon as you know about the conflict!

Grading Error
All questions concerning a test score, quiz, or assignment must be resolved within one week. It is always a good idea to keep all your work until the end of the semester. In case of any recording errors or doubts, you my produce them for correction or verification.

Extra Credit
I reserve the right to assign extra credit work to the class at large. I will not give extra credit to any single student under any circumstance.

Academic Honesty Policy
You are expected to avoid all forms of academic dishonesty as defined in the Catalog. In addition, students are expected to behave in an ethical manner in all class activities. If you feel uncertain about a particular activity, please speak to me BEFORE problems arise. Ethical behavior in a requirement for passing this course. All work submitted for grading must be the student's own work. Plagiarism will result in a score of 0 (zero) for the work or dismissal from the course and the Dean of Students office will be notified. No copying from another student's work, of any class, is allowed. It is the student's duty to allow no one to copy his or her work. Anyone found cheating and/or copying, in the exams or assignments, in the instructor's opinion, will receive an automatic F for the course.

Collaboration
You may discuss assignments with your fellow students but ensure that you do not copy their work or allow your work to be copied.

Cell Phone Use
Please refrain from the use of cellular devices during class, as it is distracting to not only you, but also to your instructor and peers. Turn off or at least silence your cell phones and beepers when you enter the classroom.

Laptop Use
Laptops will be used for the duration of this class during class demonstrations. Please refrain from the use of such devices during the lecture portion of the class, as it is distracting to not only you, but also to your instructor and peers.

Food in Class
No food is allowed.

Student Safety Trainings
Required safety trainings and/or lab safety seminars must be successfully completed once every academic year, normally in the Fall. Students will be required to take the course from Blackboard in either the first lecture or first lab to complete their training assignments and show the certificate of completion before the end of the class or lab. Students who are still covered by having taken the safety training earlier should show their certificate of completion. For students unable to attend first day of class/lab (or still registering for the class), a reasonable completion date will be flagged in Starfish. A possible grade penalty can be enforced for non-completion.

K. COLLEGE AND UNIVERSITY POLICIES

Campus Emergencies*

At TAMU-CC, your safety is a top concern. We actively prepare for natural disasters or human-caused incidents with the ultimate goal of maintaining a safe and secure campus.

- For any emergency, dial the University Police Department (UPD) at **361-825-4444** or dial 911. It's a good idea to have the UPD emergency number (and non-emergency number 361-825-4242) saved in your cell phone.
- There are nearly 200 classroom telephones throughout campus. If you feel threatened or need help and don't have a cell phone, dial 4444 (emergency) or 4242 (non-emergency) to be connected to UPD.
- If we hear a fire alarm, we will immediately evacuate the building and proceed to _____(location).
    - Proceed to the nearest building exit or evacuation stairway. Do not use the elevator. Persons who need help navigating stairs should proceed to a marked Area of Rescue Assistance, if possible.
    - Persons with disabilities should speak with their faculty about how to best assist them in case of an emergency.
    - Review the evacuation route (see specific Building Emergency Plan).
- TAMU-CC employs the Code Blue Emergency Notification System, an alert system which connects the campus community during emergency situations.
    - The notifications include emails, text and pre-recorded messages, as appropriate.
    - Code Blue emergencies may include severe weather warnings, threats, school

closures, delays, evacuations and other incidents which disrupt regular campus activities.
    - Students can update personal contact information anytime at https://emergency.tamucc.edu/contactform/
- Shelter in Place via Code Blue.
    - "Shelter-in-place" means to take immediate shelter where you are and may be implemented for severe weather, hazardous material spills, active shooters or other dangerous situations.
    - If there is a shelter in place for a **tornado warning**, our preferred location is the bottom floor of this building, away from windows and doors.
- Active Threat Protocol. There are three things you could do that make a difference if there is an active threat: Run, Hide, and/or Fight. For more information about the Run, Hide, Fight protocol, including what to do when law enforcement arrives, visit http://safety.tamucc.edu/ems/activethreat.html

For the *Quick Campus Guide to Campus Emergencies* (including a list of Areas of Rescue Assistance and additional protocols on assisting persons with physical disabilities, hurricanes, bomb threats, animal bites, crime reporting, elevator entrapment, etc.), visit https://safety.tamucc.edu/uploads/Site/finalbooklet.pdf

- **Academic Integrity (University)**

  University students are expected to conduct themselves in accordance with the highest standards of academic honesty. Academic misconduct for which a student is subject to penalty includes all forms of cheating, such as illicit possession of examinations or examination materials, falsification, forgery, complicity or plagiarism. (Plagiarism is the presentation of the work of another as one's own work.) In this class, academic misconduct or complicity in an act of academic misconduct on an assignment or test will result in a failing grade.

- **Classroom/Professional Behavior**

  Texas A&M University-Corpus Christi, as an academic community, requires that each individual respect the needs of others to study and learn in a peaceful atmosphere. Under Article III of the Student Code of Conduct, classroom behavior that interferes with either (a) the instructor's ability to conduct the class or (b) the ability of other students to profit from the instructional program may be considered a breach of the peace and is subject to disciplinary sanction outlined in article VII of the Student Code of Conduct. Students engaging in unacceptable behavior may be instructed to leave the classroom. This prohibition applies to all instructional forums, including classrooms, electronic classrooms, labs, discussion groups, field trips, etc.

- **Statement of Civility**

  Texas A&M University-Corpus Christi has a diverse student population that represents

the population of the state. Our goal is to provide you with a high quality educational experience that is free from repression. You are responsible for following the rules of the University, city, state and federal government. We expect that you will behave in a manner that is dignified, respectful and courteous to all people, regardless of sex, ethnic/racial origin, religious background, sexual orientation or disability. Behaviors that infringe on the rights of another individual will not be tolerated.

- **Deadline for Dropping a Course with a Grade of W (University)**
  I hope that you never find it necessary to drop this or any other class. However, events can sometimes occur that make dropping a course necessary or wise. **Please consult with your academic advisor, the Financial Aid Office, and me, before you decide to drop this course.** Should dropping the course be the best course of action, you must initiate the process to drop the course by going to the Student Services Center and filling out a course drop form. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class. Please consult the Academic Calendar (http://www.tamucc.edu/academics/calendar/) for the last day to drop a course.

- **Grade Appeals (College of Science and Engineering)**
  As stated in University Procedure 13.02.99.C0.03, Student Grade Appeal Procedures, a student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is upon the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is required to first discuss the matter with the instructor. For complete details, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, see University Procedure 13.02.99.C0.03, Student Grade Appeal Procedures. These documents are accessible through the University Rules website at http://academicaffairs.tamucc.edu/rules_procedures/assets/13.02.99.c0.03_student_grade_appeals.pdf. For assistance and/or guidance in the grade appeal process, students may contact the chair or director of the appropriate department or school, the Office of the College of Science and Engineering Dean, or the Office of the Provost.

- **Disability Services**
  The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please call (361) 825-5816 or visit Disability Services in Corpus Christi Hall 116.

  If you are a returning veteran and are experiencing cognitive and/or physical access issues in the classroom or on campus, please contact the Disability Services office for assistance at (361) 825-5816.

http://disabilityservices.tamucc.edu/

- **Civil Rights Complaints**
  Texas A&M University-Corpus Christi is committed to fostering a culture of caring and respect that is free from discrimination, relationship violence and sexual misconduct, and ensuring that all affected students have access to services. For information on reporting Civil Rights complaints, options and support resources (including pregnancy support accommodations) or university policies and procedures, please contact the University Title IX Coordinator, Sam Ramirez (Samuel.ramirez@tamucc.edu) or Deputy Title IX Coordinator, Rosie Ruiz (Rosie.Ruiz@tamucc.edu) x5826, or visit website at Title IX/Sexual Assault/Pregnancy.

  Limits to Confidentiality. Essays, journals, and other materials submitted for this class are generally considered confidential pursuant to the University's student record policies. However, students should be aware that University employees, including instructors, are not able to maintain confidentiality when it conflicts with their responsibility to report alleged or suspected civil rights discrimination that is observed by or made known to an employee in the course and scope of their employment. As the instructor, I must report allegations of civil rights discrimination, including sexual assault, relationship violence, stalking, or sexual harassment to the Title IX Coordinator if you share it with me.

  These reports will trigger contact with you from the Civil Rights/Title IX Compliance office who will inform you of your options and resources regarding the incident that you have shared. If you would like to talk about these incidents in a **confidential** setting, you are encouraged to make an appointment with counselors in the University Counseling Center.
- **Statement of Academic Continuity**
  In the event of an unforeseen adverse event, such as a major hurricane and classes could not be held on the campus of Texas A&M University–Corpus Christi; this course would continue through the use of Blackboard and/or email. In addition, the syllabus and class activities may be modified to allow continuation of the course. Ideally, University facilities (i.e., emails, web sites, and Blackboard) will be operational within two days of the closing of the physical campus. However, students need to make certain that the course instructor has a primary and a secondary means of contacting each student.

L. OTHER INFORMATION

- **Academic Advising**
  The College of Science & Engineering requires that students meet with an Academic

Advisor as soon as they are ready to declare a major. The Academic Advisor will set up a degree plan, which must be signed by the student, a faculty mentor, and the department chair. Meetings are by appointment only; advisors do not take walk-ins. Please call or stop by the Advising Center to check availability and schedule an appointment. The College's Academic Advising Center is located in Center for Instruction 350 or can be reached at (361) 825-3928.

GENERAL DISCLAIMER

I reserve the right to modify the information, schedule, assignments, deadlines, and course policies in this syllabus if and when necessary. I will announce such changes in a timely manner during regularly scheduled lecture periods.