CSCI 458 – Network Security and Management

COURSE SYLLABUS: Spring 2023

INSTRUCTOR INFORMATION

Instructor	Prof. Eman Hammad
Office Location	RELLIS ACB2-208
Office Hours	TBD, or by appointment
Email	eman.hammad **at** tamuc **dot** edu (1-2 business days) Email subject MUST contain CSCI458 – Spring 2023
Communication Response Time	Within 24 hours on weekdays, but any communication after Friday 5pm will be responded to by the following Monday

COURSE INFORMATION

Lectures (time/location):

- Tuesday/Thursday, 9:10 – 10:25 am.

- Synchronously: in-person (room TBD).

Textbook(s) Recommended:
- CompTIA Security+ Guide to Network Security Fundamentals, 6th Edition.
- Cryptography and Network Security, 8th Edition, William Stallings, Pearson.
- Network Security Essentials, 6th Edition, William Stallings, Pearson.

Course Description

This course covers network security topics including network access control, intrusion detection and prevention, network and communication protection, network segmentation and flow control/monitoring. Network deep packet inspection and anomaly detection.

Student Learning Outcomes

Upon completing this course, students should be able to:
- Compare and contrast physical security and hardware security.
- Identify the security principles and techniques required to secure a network infrastructure.
- Describe and illustrate denial of service and DNS attacks; define firewalls and VPNs.
- Explain attacks targeting networks including malware, denial of service, man in the middle, DNS poisoning, etc.
- Describe web application attacks, Internet browsers and wireless security attacks; illustrate vulnerabilities and solutions.
- Illustrate network security defenses, redundancy, back-up, and restoration and file encryption.
- Illustrate different network security monitoring, assessment and audit techniques; explain penetration testing, protocol analysis and log management.
- Apply skills learned in previous courses and in this course to configure a network and implement security measures and policies; communicate the results digitally.

The syllabus/schedule are subject to change.

COURSE REQUIREMENTS

Minimal Technical Skills Needed

PREREQUISITES: CSCI 310, CSCI 434.

Instructional Methods

The course will consist mainly of lectures, discussions and student presentations. Important material from the text and outside sources will be covered in class. Hence, class attendance and good note taking are essential for success. Students are expected to contribute to each class in the form of discussion and questions. Therefore, it is necessary to do any required reading before class. This syllabus contains an overview of what will be covered in class; for specific information, students are referred to the D2L class portal. The course portal will contain lectures, project information and supporting material. Information on D2L will be updated frequently so it is a good idea to check it regularly.

In summary: we will using traditional and active learning methods, and work together using:

- In-class lectures using slides, supplementary materials, discussions and hands-on exercises.
- Assignments that will be released via the Learning Management Systems (D2L).
- Individual / group projects: details of the project will be released during week 2.

Student Responsibilities or Tips for Success in the Course

1. It is expected that you are the owner of your success in this course, including ensuring you understand the expectations, timelines, policies and learning objectives.
2. Baseline expectations:

   a. Check LMS frequently.
   b. Follow the material in the textbook frequently, and use the slides as your guideline.
   c. Start your homework assignments early.
   d. Check the feedback on homework assignments.
   e. Do your work independently: collaboration and participation in study groups is encouraged to improve your understanding and to develop problem-solving strategies. However, cheating and plagiarism will not be tolerated, i.e. do not copy other people's work.
   f. Communicate with the instructor when you are confused, or having difficulties with the course material / assignment / project.

GRADING

Final grades in this course will be based on the following scale: A = 90%-100%, **B = 80%-89%, C = 70%-79%, D = 60%-69%, F = 59% or Below**. Class attendance, doing all your project and homework will help the borderline cases. Check your grades often. Any score may be disputed up to seven (7) days after the score is posted. After 7 days, the score remains as-is.

Assessments

Assessment Type	Weight of Final Grade	Learning Objectives
Assignments, quizzes & participation	30%	Critical understanding and problem solving using course concepts
Midterm exam	20%	
Final exam	30%	
Project & presentation	20%	

COURSE OUTLINE / CALENDAR

Week	Course Subject
Week 1	Overview and Introduction
Week 2	Network Threat Landscape
Week 3	Cryptography
Week 4	Integrity, Authentication and Access Control
Week 5	Physical-Layer Security
Week 6	Transport-Layer Security
Week 7	IP Security, Wireless Networks Security
Week 8	**Midterm exam 1, Project Midterm Presentations**
Week 9	Spring Break
Week 10	Web/DNS/Email Security
Week 10	Network Security Defenses and Controls
Week 12	Resilient Network Topologies
Week 13	Network Security Testing
Week 14	Cloud Security
Week 15	IoT and Vehicular Networks Security
Week 16	**Project Presentations, Final Exam (comprehensive)**

*The schedule is **tentative** and may be adjusted to fit the actual class progress.

Submitting Assignments:

- There will be several assignments, labs, and/or quizzes that are tightly related to the class materials and topics. Submissions are expected to be completed in good quality and by the deadlines.

- Your completed work must be placed in the appropriate dropbox in D2L Online. **DO NOT EMAIL ME ANY ASSIGNMENTS AS THEY WILL BE DELETED**. If you have challenges in accessing D2L temporarily, you can email me your assignment as a proof of on-time submission. **However**, you still need to upload it to the assignment folder as soon the issue is resolved to receive credit.

- You MUST check your files before and after uploading them to D2L to ensure they can be open appropriately. In the case that the instructor is not able to open your submission file(s) your submission will not be graded.

The syllabus/schedule are subject to change.

- Unless special instructions are provided**, assignments are NOT to be posted on ANY discussion board, online websites or file-sharing platforms**. Please follow the rules for naming and posting assignments.
- All assignments must be submitted using D2L if applicable. Students must adhere to the following rules when submitting assignments. Failure to do so will affect their grades.
    - **File Name:** Should be named according to the following pattern:
      <LastName>_<FirstName>_AX.pdf, where LastName is the student's last name, FirstName is the student's first name, and X is the assignment number
    For example, my assignment3, file submission will be named Hammad_Eman_A3.pdf.

TECHNOLOGY REQUIREMENTS

LMS

All course sections offered by Texas A&M University-Commerce have a corresponding course shell in the myLeo Online Learning Management System (LMS). Below are technical requirements

LMS Requirements: https://community.brightspace.com/s/article/Brightspace-Platform-Requirements
LMS Browser Support: https://documentation.brightspace.com/EN/brightspace/requirements/all/browser_support.htm

ACCESS AND NAVIGATION

You will need your campus-wide ID (CWID) and password to log into the course. If you do not know your CWID or have forgotten your password, contact the Center for IT Excellence (CITE) at 903.468.6000 or helpdesk@tamuc.edu.
Note: Personal computer and internet connection problems do not excuse the requirement to complete all course work in a timely and satisfactory manner. Each student is expected to have a backup method to deal with these inevitable problems. In case of extreme technology related circumstances, please communicate directly with the instructor to best manage your success in this course.

COMMUNICATION AND SUPPORT

Technical Support

If you are having technical difficulty with any part of Brightspace, please contact Brightspace Technical Support at 1-877-325-7778. Other support options can be found here:

https://community.brightspace.com/support/s/contactsupport

Interaction with Instructor Statement

To communicate with me about this course, kindly use the email address included in this syllabus. During the week,you can generally expect a response to your emails within 1-2 business days. *If you do not receive my response in 2 business days, please send a second email to me.*

To ensure I get your email and respond within indicated timelines above, please make sure that:

- Your email message is sent from your Texas A&M Commerce student account.
- Your email message includes a descriptive subject with the indicated prefix: **CSCI 458– Spring 2023 : <descriptive subject>**

COURSE AND UNIVERSITY PROCEDURES/POLICIES

The syllabus/schedule are subject to change.

Course Specific Procedures/Policies

Attendance is required but not graded. Students are expected to do the readings, attend class, and participate in class discussions. Each student is responsible for managing their own time and work-load. Emergency / extreme circumstances causing a student to miss deadlines/exams will need to be supported by official and university approved documentation.

Positive Learning Environment

Your commitment as a student to learning is evidenced by your enrollment at Texas A &M University-Commerce. "All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment." (See Student's Guide Handbook, Policies and Procedure, Conduct).

Sharing Your Work

All work produced by students may be shared by the instructor with the class for purposes of example and training. Such work will be as anonymous as possible. Finally, the instructor may share your work anonymously with future classes or in her own writing and research.

Late Work Policy

All assignments are due at the date and time specified.
Please keep in mind that NO late work will be accepted without penalty. If an assignment is turned in after the due date, **20% of the grade will be forfeited**. An assignment must be submitted within 24 hours of the due date if you want it graded.

- You have <u>one 24-hour "late day" token</u> that can be used on any of the assignments
- After you've used your token, assignments will still be accepted up to 24 hours late, but with a 20% penalty (automatically deducted).
- Assignments turned in more than 24 hours late will NOT be reviewed and will not be graded.

Additional extensions on assignments will be granted with appropriate documentation. If you have a problem submitting an assignment on time you should contact me **BEFORE** the due date.

Makeup Policy

There will be NO makeup exams or quizzes. If you shall miss a quiz/exam because of <u>acceptable extreme circumstances</u> (hospitalization, serious injury, death in the family etc.), you may be offered to choose to receive a grade based on your in-class ranking in the next quiz/exam.

Collaboration Policy

Students are encouraged to consult with each other, with the instructor, or anyone else about any assignments / project. However, this must be limited to the discussion of the problem and sketching general approaches to a

solution. Each student is responsible for submitting their own independent solutions to the assignment / project. **Consulting another student's or group's solution is prohibited**, and <u>submitted solutions may not be copied from any source</u>. These and any other form of unacceptable collaboration on assignments constitute **cheating**. If you have any question or doubts about whether some activity would constitute cheating, please feel free to ask.

Academic Integrity

Instances of academic dishonesty will not be tolerated. Cheating on exams or plagiarism (presenting the work of another as your own, or the use of another person's ideas without giving proper credit) will result in a failing grade and sanctions by the University. **For this class, all assignments / quizzes / exams / project are to be completed by the individual student unless otherwise specified.**

Any student cheating will receive a zero on the work they are doing, and subsequent cheating will result in a failing grade and potential academic sanctions.

Basic Tenets of Common Decency

"All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment." (Student's Guide Handbook, Policies and Procedures, Conduct.). This means that rude and/or disruptive behavior will not be tolerated.

Disclaimer

This syllabus is meant to provide general guidance of what to expect from this course. The instructor reserves the right to make changes as appropriate based on the progress of the class. All changes made to this syllabus during the semester will be announced. This document has been posted electronically. If you print a copy of it, please be sure to consult the last modified date of the online version to verify that your printed copy is current.

University Specific Procedures

Student Conduct

All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. The Code of Student Conduct is described in detail in the [Student Guidebook](http://www.tamuc.edu/Admissions/oneStopShop/undergraduateAdmissions/studentGuidebook.aspx).
http://www.tamuc.edu/Admissions/oneStopShop/undergraduateAdmissions/studentGuidebook.aspx
Students should also consult the Rules of Netiquette for more information regarding how to interact with students in an online forum: https://www.britannica.com/topic/netiquette

TAMUC Attendance

For more information about the attendance policy please visit the [Attendance](http://www.tamuc.edu/admissions/registrar/generalInformation/attendance.aspx) webpage and [Procedure 13.99.99.R0.01](http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/academic/13.99.99.R0.01.pdf).
http://www.tamuc.edu/admissions/registrar/generalInformation/attendance.aspx
http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/academic/13.99.99.R0.01.p   df

Academic Integrity

Students at Texas A&M University-Commerce are expected to maintain high standards of integrity and honesty in all of their scholastic work. For more details and the definition of academic dishonesty see the following procedures:

[Undergraduate Academic Dishonesty 13.99.99.R0.03](http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/undergraduates/13.99.99.R0.03UndergraduateAcademicDishonesty.pdf)

http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/undergraduates/13.99.99.R0.03UndergraduateAcademicDishonesty.pdf

[Graduate Student Academic Dishonesty 13.99.99.R0.10](http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/graduate/13.99.99.R0.10GraduateStudentAcademicDishonesty.pdf)

http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/graduate/13.99.99.R0.10GraduateStudentAcademicDishonesty.pdf

Students with Disabilities-- ADA Statement

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 have a disability requiring an accommodation, please contact:

Office of Student Disability Resources and Services

Texas A&M University-Commerce Gee

Library- Room 162

Phone (903) 886-5150 or (903) 886-5835

Fax (903) 468-8148

Email: studentdisabilityservices@tamuc.edu

Website: Office of Student Disability Resources and Services

http://www.tamuc.edu/campusLife/campusServices/studentDisabilityResourcesAndServices/

Nondiscrimination Notice

Texas A&M University-Commerce will comply in the classroom, and in online courses, with all federal and state laws prohibiting discrimination and related retaliation on the basis of race, color, religion, sex, national origin, disability, age, genetic information or veteran status. Further, an environment free from discrimination on the basis of sexual orientation, gender identity, or gender expression will be maintained.