Course Name: Network Security
Course Number: CSCE 4930.022/5933.024
Course Instructor: Dr. Pradhumna L Shrestha
Class Hours: TuTh 8.30 AM to 10.30 AM
Office Hours: MW 1 PM to 2 PM
Email: pradhumna.shrestha@unt.edu
Office: F265

Course Objective
The primary objective of the course is to introduce students to network security paradigm. The focus will be on building excellent understanding of network security fundamentals so that the students can identify risks and vulnerabilities in a typical complex system, and decide which security technologies/methods need to be employed. The students will be taught to use network analysis tools and implement network intrusion detection and prevention systems. The students will also be taught about understand network security from system administrative perspective. The course will also consist of laboratory and project activities for hands-on experience in network analysis and security tools.

Textbook
There are no official textbooks for this course. We will use the following as references.

References
2. Additional relevant handouts and papers as deemed appropriate by the instructor

Pre-requisites
CSCE 3530 or similar

Topics to be covered

1. Network Defense
   This chapter will introduce students to techniques that can be taken to protect network and communication assets from security threats. It will cover various concepts in network defense and implementing network defense measures and using network monitoring and mapping tools.

2. Network Forensics
   This chapter will introduce students to applying tools to analyze and decipher network traffic and detect malicious activities. It will cover various forensics techniques applied to provide secure systems and involve mandatory hands-on activities to implement them.

3. Intrusion Detection/Prevention Systems
   This chapter will provide students with knowledge and skills related to detecting and analyzing vulnerabilities and threats and taking steps to mitigate associated risks. It will
4. **Network Security Administration**

This chapter will introduce students to architecture and inner workings of routers with the objective of understanding role of routers in network operations and security. It will cover various topics such as matching algorithms, scheduling and queueing, routing protocols, and router security principles and goals.

**Course Outcomes**

1. Identify significant security vulnerabilities of a typical complex system and points at which specific security technologies/methods should be employed.
2. Describe methodologies used in network defense and network forensics, and use network monitoring and mapping tools.
3. Develop ability to detect network intrusion and malwares
4. Understand the architecture, operation and algorithms routers mechanisms and how routers provide network security.
5. Develop an understanding of packet routing and the associated protocols
6. Deploy and configure IDS/IPS systems

**Grading and Schedule**

- Mid-term Exam (Tentative: 7/11): 15%
- Final Exam (Tentative: 8/8): 15%
- Homework and Assignments: 30%
- Laboratory: 20%
- Project: 20%

**NOTES:**

**ATTENDANCE POLICY**

Student attendance will be recorded. Every student who misses a class is responsible to learn the materials discussed and obtain the homework assigned on the missed class. The instructor is not responsible for re-teaching the material missed by a student who did not attend the class. Absence in class and lack of participation in class discussions may result in lowering of the grades.

**ASSIGNMENTS**

Homework and assignments will be provided on Blackboard Learn. 25% points will be deducted if you turn in your assignments a day late. You will get only half of the points if you submit your assignment a week late. Assignment turned in after a week without instructor’s approval will receive zero points. It is expected of the students to show utmost sincerity and honesty in completing their assignments. While discussion among students is encouraged, sharing solutions and copying someone else’s work is strictly prohibited. Any student engaged in such activities will get no credit for their assignment.
LABORATORY ACTIVITIES
Currently, I plan to have at least four laboratory activities in this course. The laboratory activities will be held during the regular class meetings. The data and location to do the laboratory activities will be announced on Blackboard at least one week before the lab. The students are expected to submit an individual lab report by the end of the day during which the lab session is held. If you are absent in the lab, I will not accept your report. If you have to be absent due to any reason, I would need a notification before the lab.

PROJECT
At the end of the semester, the students are expected to complete and submit a group project. A proposal is due by 6/12 11:59 PM, one from each group. There are no grades for the proposal. A template will be provided to submit the proposal. The project needs to be completed and an individual report needs to be submitted by 8/01 11:59 PM. A template for writing the report will also be provided. We will have a project demonstration and presentation session on 8/11 in the class. You will demonstrate your project as well as present using PowerPoint presentations in the class. Details of it will be provided closer to the due date. You project grade will be divided into 30% report, 30% presentation and 40% demonstration. Any general topic in area of network security can be proposed such as simulations and implementations of research work, hardware design and implementation of network security features, exploitation of security issues in networks and fixing them, etc. You are not required to add to the state-of-the-art, but copying someone else’s work without providing credit will be deemed academic dishonesty and you’ll be reported for plagiarism.

MID-TERM EXAM
The midterm exams will be conducted during the week of 7/10 (tentative). The students are expected to give the exams on their own, and no discussions or collaborations will be allowed. The schedule and format of the exam will be announced at least one week before the exam date.

FINAL EXAM
The final exam will be scheduled on the finals week. The exams will cover the topics discussed throughout the semester. The students are expected to give the exams on their own and no discussions will be allowed. The format of the exam will be provided at least two weeks before the exam date.

GRADING
If the students are not satisfied with their grades, they will have to schedule an appointment with the instructor at least 24 hours after receiving the grades. Classroom hours will not be used for discussing grades. Students are expected to keep track of their academic progress, grades will not be changed after 2 weeks of being provided.

EXTRA CREDIT
The students may get an opportunity to earn extra credit by solving take-home problems. The students are expected to solve the problems on their own. Any evidence of cheating will result in zero credit and no further opportunities to earn extra credit.
ADA STATEMENT
The University of North Texas makes reasonable academic accommodation for students with disabilities. Students seeking accommodation must first register with the Office of Disability Accommodation (ODA) to verify their eligibility. If a disability is verified, the ODA will provide you with an accommodation letter to be delivered to faculty to begin a private discussion regarding your specific needs in a course. You may request accommodations at any time, however, ODA notices of accommodation should be provided as early as possible in the semester to avoid any delay in implementation. Note that students must obtain a new letter of accommodation for every semester and must meet with each faculty member prior to implementation in each class. For additional information, see the Office of Disability Accommodation website at http://disability.unt.edu. You may also contact them by phone at (940) 565-4323.

ACCEPTABLE STUDENT BEHAVIOR
Student behavior that interferes with an instructor’s ability to conduct a class or other students’ opportunity to learn is unacceptable and disruptive and will not be tolerated in any instructional forum at UNT. Students engaging in unacceptable behavior will be directed to leave the classroom and the instructor may refer the student to the Dean of Students to consider whether the student’s conduct violated the Code of Student Conduct. The university’s expectations for student conduct apply to all instructional forums, including university and electronic classroom, labs, discussion groups, field trips, etc. The Code of Student Conduct can be found at http://deanofstudents.unt.edu.