CSCE 3560 – Computer Systems Security

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Class Location/Time: NTDP B140 / TuTh 5:30PM - 8:10PM
Office Hours: By Appointment

Canvas: This course will use the Canvas learning management system (LMS) to distribute course materials, communicate and collaborate online, post grades, and submit assignments. You are responsible for regularly checking the Canvas course site for classwork and announcements.

COURSE DESCRIPTION
This course will introduce theoretical and practical aspects of computer systems security and present ways to protect a computer system with an additional focus on distributed computing systems. Topics include operating system security, hypervisors, virtualization security, storage security, trusted hardware, trusted platform modules, application isolation, hardware security modules, crypto processors, and cloud and IoT security. Based on recent research papers, students will also explore emerging security challenges facing computer systems.

PREREQUISITE(S)
CSCE 3600 with a grade of C or better.
Linux, programming, and system knowledge are highly needed.

REQUIRED TEXT(S)
There is no required textbook for this course as the material covered is too broad for a single textbook. Instead, the course material will be drawn from a number of books and papers from various sources as well as Internet-based resources.

SUGGESTED OPTIONAL REFERENCE TEXT(S)


COURSE OUTCOMES
Upon successful completion of this course, the student will be able to:

1. Examine different layers of the computer system and identify their operations and connections with the other layers.
2. Describe and analyze the vulnerabilities in computer system layers including operating system, applications, hypervisors, storage, etc.
3. Demonstrate how to detect and prevent existing vulnerabilities in a computer system.
4. Analyze and address/mitigate the detected vulnerabilities in hardware modules.
5. Incorporate various defense techniques to protect a computer system.

ACADEMIC INTEGRITY
This course follows UNT's policy for Student Academic Integrity, which can be found at [https://policy.unt.edu/policy/06-003](https://policy.unt.edu/policy/06-003), and the Cheating Policy for the Department of Computer Science and Engineering. Specifically, the first instance of a student who has violated the academic integrity (i.e., cheating) policy will result in a grade of "F" for the course and have a report filed into the Academic Integrity Database, which may include additional sanctions.

**GRADING POLICY**

Course grade will be a weighted average according to the following:

- **Homework Assignments** 20%
- **Lab Assignments** 20%
- **Group Project** 25%
- **Midterm Exam** 15%
- **Comprehensive Final Exam** 20%
- **Total** 100.0%

**Homework Assignments**: Homework will be assigned based on the lectures and assigned reading. These assignments are meant for you to become familiar with the course material, and this practice will aid you in mastering the concepts.

**Lab Assignments**: We will have some lab assignments to have some hands-on experience in this domain. You may need to create a virtual machine on your laptop for this case. If you do not have sufficient computational power, please contact me.

**Group Project**: Students will complete a group project to apply the material and techniques learned in class, such as an application utilizing cloud platforms with the Google App Engine and Amazon Web Services (AWS).

**Midterm Exams**: There will be one midterm examination given in this course.

**Final Exam**: According to the university, a comprehensive final exam will be given during the scheduled time. All students are expected to take the final exam during the scheduled period.

**TENTATIVE SYLLABUS TOPICS** (subject to change):

- Introduction to Computer Systems Security
- Operating Systems Security
- Storage and data security
- Application Isolation and Containers
- Hypervisors
- Virtualization Security
- Cloud Computing and Security
- IoT and Security
- Trusted Hardware
- Hardware Security Modules
- Crypto processors
- Trusted Platform Modules (TPM)

**ATTENDANCE POLICY**

Student behavior that interferes with an instructor's ability to conduct a class or other students' learning opportunity 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 classrooms, labs, discussion groups, field trips, etc. The Code of Student Conduct can be found at [http://deanofstudents.unt.edu](http://deanofstudents.unt.edu) (Links to an external site.)

**ODA STATEMENT**

The University of North Texas makes reasonable academic accommodations for students with disabilities. Students seeking reasonable 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 a reasonable accommodation letter to be delivered to faculty to begin a private discussion regarding your specific needs in a course. You may request reasonable accommodations at any time; however, ODA notices of reasonable 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 reasonable accommodation for every semester and meet with each faculty member before implementation in each class. Students are strongly encouraged to deliver letters of reasonable accommodation during faculty office hours or by appointment. Faculty members have the authority to ask students to discuss such letters during their designated office hours to protect the student's privacy. For additional information, see the Office of Disability Accommodation website at [http://www.unt.edu/oda](http://www.unt.edu/oda) (Links to an external site.). You may also contact them by phone at 940.565.4323.