

# **CS 5340 Introduction to Information and Computer Security**

## **Department of Computer Science**

### **Texas Tech University**

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**Office Hours:** Wednesday 4:00 – 5:00 PM or by appointment

**TA:** TBD      **Email:** TBD

**Class Time:** 9:30 am – 10:50 am TR

**Classroom:** Holden Hall 150

**Course Description and Topics:**

The course explores the following:

- Introduction to theory and practices of information and computer security. Foundational principles of security.
- Topics include security concepts, threats, vulnerabilities, risk management, and security assurance.

Topics to be covered include:

Introduction

Security Objectives, Threats, Attacks, Assets, Design Principles, Attack Surfaces

Security Policies

Trust, Access Control, Policy Languages, Confidentiality Policies, Integrity Policies, Availability Policies, Hybrid Policies, Side Channels

Data and Privacy

De-identification, Anonymity, Differential Privacy

Authentication

Passwords, Biometrics, Multifactor Authentication

Threats Across TCP/IP Stack

Attacks at MAC, IP, Transport, Application Layers. Emphasis on web application attacks, e.g., Cross Site Scripting, Cross Site Request Forgery, Click Jacking, SQL Injection, etc.

DDoS

Mechanisms and Defenses

Malware

Viruses, Worms

Cryptography

Symmetric, Public Key, Digital Signatures, Key Exchange, PKI, Secret Sharing, Bitcoin/Block Chain

**Expected prior knowledge and skills:** Decent programming ability; especially web development.

**Learning Outcomes:** On completion of the course students should:

1. Understand the principles underlying information and computer security.
2. Apply the learned principles/topics to design and evaluate system security.

**Assessment Methods for the Learning Outcomes:**

Exams, Programming Assignments, Term Group project

Textbooks:

William Stallings, Lawrie Brown, Computer Security, Principles and Practice, 3<sup>rd</sup> Ed.

Wenliang Du, Computer Security: A Hands-On Approach.

Matt Bishop, Computer Security Art and Science, 2<sup>nd</sup> Ed.

Programming Assignments: 20%

Exam #1: 16%

Exam #2: 16%

Final: 18% (Dec 10th, 1:30 – 4:00PM)

Group Project: 30%

**Grading Rubric:**

A 90-100

B 80-89

C 70-79

D 60-69

F Below 60

**Holidays (No Classes):**

Labor Day: Sept. 5

Thanksgiving Vacation: Nov. 23-27

**COVID related items**

Vaccinations: Texas Tech University strongly recommends students adhere to CDC guidelines on COVID-19, including obtaining COVID-19 vaccinations. If you were unable to obtain a vaccination prior to your arrival on campus, the COVID-19 vaccine is available at Student Health Services by appointment. You can find additional information about the vaccine and campus vaccine clinics here: <https://www.ttu.edu/commitment/covid-19-vaccine/index.php>

Face Covering Policy: As of May 19, 2021, face coverings are optional in TTU facilities and classrooms but, based on CDC guidelines, are recommended and welcome, especially for those who have not been vaccinated for COVID-19 or who may have susceptibilities to the virus. Face coverings are required in public transportation (e.g., Citibus) and in the Student Health Clinic.

**Illness-related Absences:** Illness-related absences will require proper documentation in order to be considered an excused absence. It is the student's responsibility to communicate with the course instructor regarding adjusting course deadlines (HW, exams, etc.), due to illness, in advance of those deadlines. The instructor will work with students with documented illnesses regarding missed work or deadlines. For further information please reference the COVID-19 page (<https://www.depts.ttu.edu/communications/emergency/coronavirus/>).

**Personal Hygiene:** We all should continue to practice frequent hand washing, use hand sanitizers after touching high-touch points (e.g., door handles, shared keyboards, etc.), and cover faces when coughing or sneezing.

**Potential Changes:** The University will continue to monitor CDC, State, and TTU System guidelines in continuing to manage the campus implications of COVID-19. Any changes affecting class policies or delivery modality will be in accordance with those guidelines and announced as soon as possible. If Texas Tech University campus operations or activities in this class are required to change because of health concerns related to the COVID-19 pandemic, it is possible that this course will move to a fully online delivery format. Should that be necessary, students will need to have a computer that meets the laptop requirements of the Whitacre College of Engineering found at <https://www.depts.ttu.edu/coe/dean/engineeringitservices/buyingtherightcomputer.php>, web cam, and microphone to participate in class and conduct exams, and students will have to scan and submit course assignments as required and specified for the class.

In the event of a change to an online teaching modality, online exams and quizzes within this course may require online proctoring. Therefore, students will be required to have a webcam (USB or internal) with a microphone when taking an exam or quiz. Students understand that this remote recording device is purchased and controlled by the student and that recordings from any private residence must be done with the permission of any person residing in the residence. To avoid any concerns in this regard, students should select private spaces for the testing. The University library and other academic sites at the University offer secure private settings for recordings and students with concerns may discuss location of an appropriate space for the recordings with their instructor or advisor. Students must ensure that any recordings do not invade any third party privacy rights and accept all responsibility and liability for violations of any third party privacy concerns. Setup information will be provided prior to taking the proctored exam.

All students must review the syllabus and the requirements including the possible online terms and equipment requirements to determine if they wish to remain in the course. Enrollment in the course is an agreement to abide by and accept all terms. Any student may elect to drop or withdraw from this course before the end of the drop/add period.

Additional COVID related information and TTU COVID updates can be found at <https://www.depts.ttu.edu/communications/emergency/coronavirus/>

General information from TTU OP:

Academic Integrity

Students are responsible for reading and understanding "Student Affairs Handbook" and

specifically the university's policies on scholastic dishonesty and academic integrity. The Handbook states the following:

"Academic dishonesty includes cheating, plagiarism, collusion, falsifying academic records, misrepresenting facts and any act or attempted act designed to give unfair academic advantage to oneself or another student." Academic dishonesty are serious offenses and may be punished with failure in the course, and/or expulsion from the university.

### Classroom Civility

All violations of classroom civility will be reported to the Student Judicial Programs. The Texas Tech University Catalog states: "Students are expected to assist in maintaining a classroom environment that is conducive to learning." In order to ensure that all students gain from time spent in class, students are prohibited from engaging in any form of distraction, e.g., reading newspapers (or other articles), working on other courses, and using cell-phones or laptops for calls or messages. If you indulge in any such inappropriate behavior (without explicit consent of the instructor), you will (at the very least) be asked to leave the classroom.

### Disabilities

Any student who, because of a disability, may require special arrangements in order to meet the course requirements should contact the instructor as soon as possible to make any necessary arrangements. Students should present appropriate verification from Student Disability Services during the instructor's office hours. Please note instructors are not allowed to provide classroom accommodations to a student until appropriate verification from Student Disability Services has been provided. For additional information, you may contact the Student Disability Services office in 335 West Hall or 806-742-2405.

### Final Notes:

- The syllabus is subject to change. Any changes will be announced in the class and (or) posted on blackboard.
- In communicating with me please use your "ttu" email address. Emails from other email providers like Yahoo or Gmail will likely not go past my spam filter (or will be ignored).
- Please write the subject line of your emails in this form: "CS-5340: query title".
- All assignments will be submitted via blackboard. Please do not email them unless I ask otherwise. Late submissions will earn you a zero score. It is the student's responsibility to allow ample time between when to begin a submission on blackboard and the actual deadline. *Non responsiveness of the blackboard website in the final minutes before the deadline will not be accepted as an excuse for late submission.*