CSCI 451, 61E, Wireless and Mobile Security

COURSE SYLLABUS: Fall 2025

INSTRUCTOR INFORMATION

Instructor:	Dr. Ahmet Kurt, Assistant Professor
Office Location:	ACB2 Room 234
Office Hours:	Thursday 11am-12pm
Office Phone:	903-896-5474
Office Fax:	N/A
University Email Address:	ahmet.kurt@etamu.edu
Preferred Form of Communication**:**	Email
Communication Response Time:	Same or next day

COURSE INFORMATION

Materials – Textbooks, Readings, Supplementary Readings

Lectures (Time/Location): Meets 8/25/2025 through 12/8/2025
Mon, Wed 2:50pm-4:05pm *Campus:* Rellis Campus *Building:* ACB1 *Room:* 314

Course Textbook(s):

1. “Security in Wireless Communication Networks” by Qian et al.
2. “Wireless and Mobile Device Security” 2nd edition by Jim Doherty.

Student labs TBD.

Course Description

This course on wireless networks and mobile security will cover threats, attacks and defenses of wireless and mobile computing platforms spanning across secure coding, cryptography, physical security, underlying protocols for secure communication, and policy management in the wireless and mobile environments, including WiFi networks and mobile devices and cloud. The course will also introduce the functions of monitoring, security detection and malware prevention capabilities to protect its wireless networks and mobile customers. Prerequisites: COSC 2336.

The *syllabus/schedule are subject to change.*

Student Learning Outcomes

1. Characterize WPAN/WLAN/WWAN technologies and model adversaries, attack surfaces, and security services/mechanisms in wireless environments.
2. Apply modern cryptographic primitives, modes, and key-management (symmetric/asymmetric, hashes/MACs, PKI, EAP-TLS) to design or evaluate wireless protocols.
3. Configure and evaluate Wi-Fi security (802.1X/EAP, 802.11i/WPA2, WPA3/OWE), diagnose common misconfigurations, and propose mitigations.
4. Analyze and secure short-range systems—Bluetooth Classic/LE and Zigbee/802.15.4—covering pairing models, key handling, frame protection, and privacy.
5. Assess RFID security and privacy risks and justify lightweight cryptographic or protocol-level countermeasures for constrained devices.
6. Explain and compare cellular security across GSM/UMTS/LTE/5G, including AKA flows, key hierarchies, roaming/handover protection, and known weaknesses.
7. Explain mobile platform security models for Android and iOS, including sandboxing, permissions, secure boot/attestation, storage protection, and enterprise controls (MDM/MAM).
8. Detect, analyze, and recommend remediation for mobile threats such as device fingerprinting, application-based attacks, and basic malware behaviors in alignment with policy.

COURSE REQUIREMENTS

Minimal Technical Skills Needed

Ability to use the Internet browser to access MyLeo Learning Management System (LMS), Zoom, Microsoft Word and PowerPoint, and PDF reader. Instructional Methods This is a face-to-face course with heavy use of the MyLeo (D2L) Learning Management System (LMS), and remote learning component.

Instructional Methods

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Student Responsibilities or Tips for Success in the Course

You own your success in this course, including ensuring you understand the expectations, timelines, policies and learning objectives.

Baseline expectations:

1. Attend weekly meetings and check LMS frequently.
2. Start your work tasks/assignments early.
3. Communicate with the other students in the project regularly and frequently.

The *syllabus/schedule are subject to change.*

4. Communicate with the instructor when you are confused or having course-related difficulties.

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

Assessments

Your Final Grade Distribution is as follows:

Quizzes	15%
Lab Assignments	25%
Midterm Exam	30%
Final Exam	30%
TOTAL	100%

COURSE OUTLINE / CALENDAR

Week 1 (Aug 25 & Aug 27) — Introduction & Basic Network Security Concepts
Week 2 (Sep 1 & Sep 3) — Cryptographic Techniques
• Sep 1 – Labor Day (No Class).
Week 3 (Sep 8 & Sep 10) — More on Cryptographic Techniques
Week 4 (Sep 15 & Sep 17) — WLAN Security
Week 5 (Sep 22 & Sep 24) — Bluetooth Security
Week 6 (Sep 29 & Oct 1) — Zigbee Security
Week 7 (Oct 6 & Oct 8) — RFID Security
Week 8 (Oct 13 & Oct 15) — **Midterm Exam**
• Oct 13 – Fall Break (No Class).
Week 9 (Oct 20 & Oct 22) — GSM Security
Week 10 (Oct 27 & Oct 29) — UMTS Security
Week 11 (Nov 3 & Nov 5) — LTE Security
Week 12 (Nov 10 & Nov 12) — Security in 5G Wireless Networks
Week 13 (Nov 17 & Nov 19) — Mobile Communication Security Challenges

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Week 14 (Nov 24 & Nov 26) — Mobile Device Security Models
• Nov 26 – Reading Day (No Class).
Week 15 (Dec 1 & Dec 3) — Mobile Wireless Attacks and Remediation
Week 16 (Dec 8) — Mobile Malware and Application-Based Threats
• Dec 8 – Last day of classes
(Dec 11 – Dec 16) — **Finals Week**

TECHNOLOGY REQUIREMENTS

LMS

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

LMS Requirements:
https://community.d2l.com/brightspace/kb/categories/1172-platform-requirements

LMS Browser Support:
https://community.d2l.com/brightspace/kb/articles/5663-browser-support

Zoom Virtual Classroom Requirements:
https://support.zoom.com/hc/en/article?id=zm_kb&sysparm_article=KB0060748

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@etamu.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 needs to have a backup method to deal with these inevitable problems. These methods might include the availability of a backup PC at home or work, the temporary use of a computer at a friend's home, the local library, office service companies, Starbucks, an ETAMU campus open computer lab, etc.

COMMUNICATION AND SUPPORT

If you have any questions or are having difficulties with the course material, please contact your instructor.

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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

Please use official email to communicate with the instructor as suggested. The instructor will make an effort to answer questions in a timely manner.

COURSE AND UNIVERSITY PROCEDURES/POLICIES

Course Specific Procedures/Policies

See above

Syllabus Change Policy

The syllabus is a guide. Circumstances and events, such as student progress, may make it necessary for the instructor to modify the syllabus during the semester. Any changes made to the syllabus will be announced in advance.

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

https://www.etamu.edu/wp-content/uploads/2025/06/2024-2025-Student-Guidebook-1.pdf.

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

ETAMU Attendance

For more information about the attendance policy, please visit the webpages below.

Attendance,

https://inside.tamuc.edu/admissions/registrar/generalInformation/attendance.aspx

Academic Integrity

Students at East Texas A&M University 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 Students Academic Integrity Policy and Form

Undergraduate Academic Dishonesty 13.99.99.R0.03

https://inside.tamuc.edu/aboutus/policiesproceduresstandardsstatements/rulesProcedures/13students/undergraduates/13.99.99.R0.03.pdf

Undergraduate Student Academic Dishonesty Form

https://inside.tamuc.edu/aboutus/policiesProceduresStandardsStatements/rulesProcedures/documents/13.99.99.R0.03UndergraduateStudentAcademicDishonestyForm.pdf

Graduate Students Academic Integrity Policy and Form

Graduate Student Academic Dishonesty

https://inside.tamuc.edu/aboutus/policiesProceduresStandardsStatements/rulesProcedures/13students/graduate/13.99.99.R0.10.pdf

Graduate Student Academic Dishonesty Form

https://inside.tamuc.edu/academics/graduateschool/faculty/GraduateStudentAcademicDishonestyForm.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 Services
Velma K. Waters Library- Room 162
Phone (903) 886-5930
Fax (903) 468-8148
Email: StudentDisabilityServices@etamu.edu
Website: https://www.etamu.edu/student-disability-services/

Nondiscrimination Notice

East Texas A&M University 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.

Campus Concealed Carry Statement

Texas Senate Bill - 11 (Government Code 411.2031, et al.) authorizes the carrying of a concealed handgun in East Texas A&M University buildings only by persons who have been issued and are in possession of a Texas License to Carry a Handgun. Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so. Pursuant to Penal Code (PC) 46.035 and East Texas A&M Rule 34.06.02.R1, license holders may not carry a concealed handgun in restricted locations.

For a list of locations, please refer to the Carrying Concealed Handguns On Campus document and/or consult your event organizer.

Web url:
http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/34SafetyOfEmployeesAndStudents/34.06.02.R1.pdf

Pursuant to PC 46.035, the open carrying of handguns is prohibited on all East Texas A&M campuses. Report violations to the University Police Department at 903-886-5868 or 9-1-1.

East Texas A&M Supports Students' Mental Health

Counseling Center Services

The Counseling Center at East Texas A&M, located in the Halladay Building, Room 203, offers counseling services, educational programming, and connection to community resources for students. Students have 24/7 access to the Counseling Center's crisis assessment services by calling 903-886-5145. For more information regarding Counseling Center events and confidential services, please visit https://www.etamu.edu/counseling-center/