Course Syllabus

Wireless Networking

E-mail: Canvas class e-mail

Office hours: By appointment

Course Description

This course explores wireless network and mobile device security. Students will begin by learning about the history of data networks and the evolution of wired and wireless networking. They will also review the mobile revolution. Then they will explore wireless local area network (WLAN) design and the operation and behavior of wireless in general, particularly on 802.11 WLANs, along with the threats and vulnerabilities directly associated with 802.11 wireless networks, their various topologies, and devices.

The course then addresses basic security measures for small office/home office (SOHO) networks, as well as more-advanced wireless security concepts unique to the needs of larger organizations. Topics here include WLAN auditing and monitoring, and risk assessment procedures for WLAN and Internet Protocol (IP) mobility. Finally, the course examines risks and vulnerabilities of mobile devices, security models associated with the most common mobile operating systems, and mobile device fingerprinting techniques.

Link to Institutional Syllabus

Learning Resources:

- Free access to O'Reilly Books Online (Links to an external site.)
- Internet
- Doherty, Jim. *Wireless and Mobile Device Security*, Second Edition, Burlington, MA: Jones & Bartlett Learning, 2022 (ISBN 9781284211726)

Student progress will be assessed using:

- Knowledge assessments – Assignments across the curriculum
- Project – One Final Class Project

Learning Objectives:

- Provide an overview of the evolution of data, wireless, and mobile networks.

- Describe technologies and architectures that support wireless networks, the Internet of Things (IoT), and cloud environments.
- Describe security threats and risks associated with wired, wireless, and mobile networks.
- Explain how WLANs work.
- Describe wireless and mobile attacks and remediation.
- Summarize WLAN and mobile device security measures.
- Describe WLAN auditing and risk assessment techniques.
- Summarize various mobile device security challenges and mobile device security models.
- Describe mobile fingerprinting and profiling, and their implications on privacy and security.

Grading:

All courses in the Computer Science department will use the following grade scale:

A	94-100	B+	87-89.99	C+	77-79.99	D+	67-69.99	E	0-59.99
A-	90-93.99	B	84-86.99	C	74-76.99	D	64-66.99		
		B-	80-83.99	C-	70-73.99	D-	60-63.99		

Academic dishonesty: Academic dishonesty, including cheating, plagiarism, misrepresentation or collaboration, will not be tolerated in the CSIS department.

ADA statement: SLCC values inclusive learning environments and strives to make all aspects of the College accessible to our students. If you have a disability and believe you need accommodations to improve access to learning materials or the learning

[redacted]

Schedule:

Week 1

Chapter 1: The Evolution of Data and Wireless Networks

Chapter 2: The Mobile Revolution

Chapter 3: Anywhere,Anytime, on Anything: "There's an App for That!"

Chapter 4: Security Threats Overview: Wired, Wireless, and Mobile

Week 2

Chapter 5: How Do WLANs Work?

Chapter 6: WLAN and IP Networking Threat and Vulnerability Analysis

Chapter 7: Basic WLAN Security Measures

Chapter 8: Advanced WLAN Security Measures

Week 3

Chapter 9: WLAN Auditing Tools

Chapter 10: WLAN and IP Network Risk Assessment

Chapter 11: Mobile Communication Security Challenges

Chapter 12: Mobile Device Security Models

Week 4

Chapter 13: Mobile Wireless Attacks and Remediation

Chapter 14: Fingerprinting Mobile Devices

Chapter 15: Mobile Malware and Application-Based Threats

Course Summary:

Date	Details
Sun Oct 18, 2020	Assignment Monday's Assignment: Complete Chapters 1 and 2
	Assignment Monday's Assignment: Complete Modules 10 and 11

Date	Details
Tue Jan 17, 2023	Discussion Topic Discussion: The OSI Reference Model
Tue Jan 24, 2023	Assignment Assignment: The Evolution of Mobile Technologies
	Discussion Topic Discussion: The Impact of Mobile IP
Tue Jan 31, 2023	Assignment Assignment: The Best Mobile Business App
	Discussion Topic Discussion: Zero Trust
	Assignment Wireless Lab1
Tue Feb 7, 2023	Assignment Assignment: Wireless and Mobile Device Threats
	Discussion Topic Discussion: Context-Aware Security
Tue Feb 14, 2023	Assignment Assignment: ELI5: How a Wireless Access Point Works
	Discussion Topic Discussion: SOHO Site Surveys
Tue Feb 21, 2023	Discussion Topic Discussion: Securing Bluetooth Devices
	Assignment Wireless Lab2
Tue Feb 28, 2023	Discussion Topic Discussion: Increasing Security on a SOHO Network
	Assignment Project: WLAN and Mobile Security Plan Part 1: WLAN and Mobile Vuln
Mon Mar 6, 2023	Assignment Assignment: Creating VLANs for a Wireless Network
	Discussion Topic Discussion: Wi-Fi as a Service
Tue Mar 21, 2023	Assignment Assignment: Researching WLAN Auditing Tools

Date	Details
	Discussion Topic Discussion: Creating a WLAN Auditing Toolkit
	Assignment Wireless Lab3
Tue Mar 28, 2023	Discussion Topic Discussion: Determining the Appropriate Type of Risk Assessment
	Assignment Project: WLAN and Mobile Security Plan Part 2: WLAN and Mobile Audi
Tue Apr 4, 2023	Discussion Topic Discussion: Mobile Device Vulnerabilities and Exploits
Tue Apr 11, 2023	Discussion Topic Discussion: The Security of Continuity Technology
	Assignment Project: WLAN and Mobile Security Plan Part 3: BYOD, Wireless, and Mo
Tue Apr 18, 2023	Discussion Topic Discussion: Mitigating a Rogue Access Point
Tue Apr 25, 2023	Discussion Topic Discussion: Spy Cells
	Assignment Project: WLAN and Mobile Security Plan Part 4: Final Report and Presenta
Tue May 2, 2023	Discussion Topic Discussion: Mobile Device Penetration Testing