Course Outline

1. Document Information

Degree Program	Computer Science
Course Number	CS 510
Course Title	Wireless and Network Security
Semester Hours	3
Course Coordinator	Koushik Sinha
Revision Term	Fall 2020
Latest Revision	Spring 2021

2. Catalog Description

Advanced security concepts of distributed systems and wireless networks are presented. Topics include IEEE 802.11 security, Wireless Encryption and Authentication, Key Management in Networks, Distributed Denial of Service Attacks, Routing Security, Intrusion Detection and Mobile Code Security.

3. Textbooks

- Earle, A. E. (2005). Wireless Security Handbook. Auerbach Publications.
- Xiao, Y. Du, D-Z., & Shen, X. (2006). Wireless Network Security. Springer-Verlag..

4. References

5. Course Learning Outcomes

- To introduce the principles, mechanisms and implementation of security in distributed systems.
- To provide a thorough coverage of the up-to-date wireless encryption and authentication protocols.
- To introduce the details of distributed security attacks and how to detect and handle such attacks.
- To have students gain hands-on experience with programming techniques for wireless security protocols.

6. Assessment of the Contribution to Student Outcomes

Outcome	1	2	3	4	5	6	7
Assessed		X	X		X		

7. Prerequisites by Topic

CS 410 with a grade of C or better or consent of the instructor.

8. Major Topics Covered in the Course

1. Introduction
   Wireless Basics
   Review of Characteristics of Wireless Networks
   Review of Routing in Wireless Networks
   Review of IEEE 802.11 and Bluetooth{3 classes}
2. Wireless Encryption and Authentication
   Review of Security Basics
   WEP, WPA, WPA2
   IEEE 802.11x, IEEE 802.11i, VPN over Wireless , RC4, RC5
   Bluetooth Security
   Encryption and Authentication in Wireless Sensor Networks {10 classes}
3. Key Management
   Key Management in Wired Networks
   Key Management in Wireless Networks {9 classes}
4. Distributed Trust
   Trust Models in Distributed Systems
   Reputation based Trust
   Recommendation based Trust {3 classes}
5. Routing Security
   Routing Security Attacks
   Routing Security of Internet / BGP
   Routing Security of Mobile Ad Hoc Networks
   Routing Security of Wireless Sensor Networks {9 classes}
6. Intrusion Detection
   Intrusion Detection in Wired Networks
   Host-based and Network-based IDS
   Intrusion Detection in Wireless Networks {6 classes}