

**ECE 7970 – Selected Topics in Electrical Engineering:
ADVANCED CRYPTOGRAPHY APPLICATIONS IN EMERGING WIRELESS
NETWORKS**

Course Description:

Lec. 3, Credit 3

Advanced topics in the design of security and privacy protocols for the emerging wireless networks. Using advanced cryptography techniques to solve new security/privacy problems raised in the emerging wireless networks.

Prerequisites: ECE 6900: Special Problems in Electrical Engineering: Security and privacy preservation for wireless networks, or a consent from the instructor.

Prerequisites by Topic:

1. Knowledge of security concepts and basic cryptography primitives.
2. Knowledge of high level programming language (C).
3. Knowledge of network concepts.

Textbook(s) and/or Other Required Material(s):

No Required Text Book, Instructor will provide Class notes, tutorials and research papers

Course Coordinator: Dr. Mohamed Mamoud

Class Schedule:

Lecture: 3 hrs/week

Course Goal(s):

To address the research streams in the security/privacy of the emerging wireless networks' applications.

Course Topics:

1. Review to basic concepts in wireless networks. 5%
2. Review to basic security concepts and cryptography primitives. 15%
3. Emerging applications for wireless networks. 10%

4. Security and privacy challenges in emerging wireless networks' applications. 10%
5. Advanced security schemes for the emerging wireless networks. 30%
6. Advanced privacy-preserving schemes for the emerging wireless networks. 30%

Each topic will be covered via lectures and reading relevant research papers.

Instructional Outcomes for the Course:

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

1. Understand the new applications of the emerging wireless networks.
2. Understand the security/privacy threats of emerging wireless networks.
3. Understand advanced techniques to tackle the security/privacy threats of emerging wireless networks.
4. Understand how new applications/networks can necessitate new security/privacy solutions.
5. Use cryptosystems efficiently to achieve security/privacy goals.
6. Analyze security protocols and identifying flaws.
7. Utilize advanced cryptography to solve new security/privacy problems in the emerging wireless networks.