

CSCE 4013 (future course number will be CSCE 4043), RFID INFOSEC, Elective

Catalog Description: Radio frequency identification (RFID) information systems provide information to users about objects with RFID tags. They require the application of information systems security (INFOSEC) to protect the information from tampering, unauthorized information disclosure, and denial of service to authorized users. This course addresses security and privacy in an RFID system.

Prerequisites: Statistics (INEG3313 or STAT3013)

Textbook/required material: Daniel M. Dobkin, *The RF in RFID: passive UHF RFID in practice*, Oxford, UK: Elsevier, 2008. ISBN: 978-0-7506-8209-1. Website: <http://rfidsecurity.uark.edu>

Course learning outcomes: The goal of the class is for students to understand security and privacy issues in radio frequency identification (RFID) systems.

Topics covered:

- RFID Background: History, Applications, RFID Reference Model, Types of Tags, Shareholders, Hacking, Social Implications, and Privacy
- RFID Security: Confidentiality, Integrity, Availability, Threats, Cryptography, and Threat Modeling
- Tag Layer: Architecture, EPCglobal Gen2 Tag Finite State Machine, Threats, Risks, and Mitigation
- Media Interface Layer: Frequency Bands, Electromagnetics, Antennas, Nominal Read Range, Modulation, Encoding, Data Rates, Fast Fourier Transform, Singulation, Regulations, Threats, Risks, and Mitigation
- Reader Layer: Architecture, Antenna Configurations, Gen2 Sessions, Gen2 Single-, Multiple-, and Dense-Interrogator Operation, Low Level Reader Protocol (LLRP), Middleware, Threats, Risks, and Mitigation
- RFID Standards, Laws, Regulations, Policies, and Guidelines: EPCglobal, ISO/IEC Item Management, Contactless Smart Cards, Animal Identification, FCC Rules for ISM Band, Identity Standards, and Guidelines for Securing RFID Systems

Class/laboratory schedule: Meets either 3 times a week for 50 minutes or 2 times a week for 1 hour 20 minutes for 15 weeks.

Contribution of course to meeting requirements of Criterion 5: This course prepares students for designing systems that have constraints using knowledge and skills acquired in earlier coursework.

Relationship of course to Program Outcomes: (c) An ability to design, implement and evaluate a computer-based system, process, component or program to meet desired needs. (e) An understanding of professional, ethical, legal, security, and social issues and responsibilities. (g) An ability to analyze the local and global impact of computing on individuals, organizations and society.

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