

CEN 5079 Secure Application Programming

Catalog Description

Development of applications that are free from common security vulnerabilities, such as buffer overflow, SQL injection, and cross-site scripting attacks. Emphasis is on the development of distributed web applications. (3 credits)

Prerequisites

SCIS Graduate Standing

Type

Required for MS in Cybersecurity

Course Objectives

This course provides an introduction to the fundamental concepts of secure programming and testing practices, and how to avoid security related bugs and vulnerabilities. It covers a practical taxonomy of security bugs such as cross-site scripting. Then it discusses techniques to avoid or detect security bugs, including code review (using static analysis), penetration testing, and risk-based security testing. Throughout the topics, one central theme is risk management, giving the complexity of today's software systems. This course also touches on high level issues such as the business context that influence software design decisions and risk assessment.

Topics

- Software security fundamentals: basic science, bugs, software security and operations
- Survey and case study of coding errors: input validation (cross-site scripting, buffer overflow, SQL injection), API abuse, race condition, error handling, encapsulation, environment
- Risk management: business context, business and technical risks, ranking risks, fixes and validation
- Architecture risk analysis
- Static analysis tools to find implementation bugs
- Software penetration testing
- Risk-based security testing
- Abuse cases: anti-requirements, abuse attack model
- Enterprise software security: business climate, metrics, secure development lifecycle
- Security knowledge management: expertise, security knowledge, the Department of Homeland Security Build Security In Portal

Textbooks

Pfleeger and Pfleeger. *Security In Computing, 5th Edition*. Prentice Hall. ISBN: 0-13-408504-3. **(Required)**

Imran Bashir. *Mastering Blockchain, Second Edition*. Packt. ISBN: 978-1-78883-904-4 **(Recommended)**

Wenliang Du. *Computer & Internet Security: A Hands-on Approach, Second Edition*
ISBN: 978-1-7330039-3-3. **(Highly Recommended)**

Last Update

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