Software Security and Dependability

ENGR5560G

Lecture 00

Syllabus and Teaching Philosophy

Dr. Khalid A. Hafeez

Spring, 2025

Instructor

- Instructor : **Dr. Khalid A. Hafeez**
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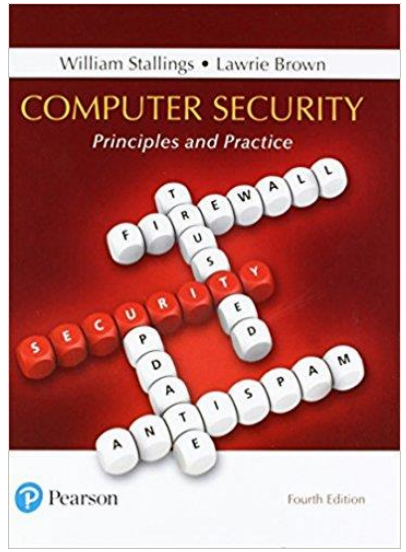
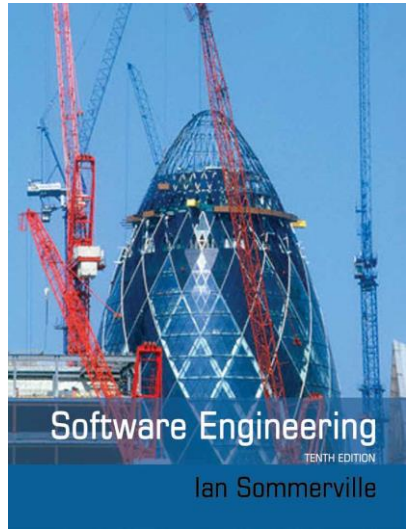
  - Office: SIRC 3387
  - Office hours:
    - Tuesday: 12 - 1 pm

Books

- Title: Computer Security: Principles and Practice
  - Edition: 5th
  - Author: William Stallings / Lawrie Brown
  - ISBN #: 13: 9780138091712
  - Publisher: Pearson



- Title: Software Engineering
  - Edition: 10th
  - Author: Ian Sommerville
  - ISBN #: 13: 9780133943030
  - Publisher: Pearson



Class Meetings

Location	CRN #	Sec	Date	Day	Time
SIRC1350	12147	01	May. 05, 2025 June. 16, 2025	Tuesday Thursday	9:10am - 12:00 pm 9:10am - 12:00 pm

Course Evaluation

Category	Mark
Quizzes and/or in class activities	10%
Project	25%
Midterm	25%
Final	40%

- **Quizzes**:
  - Expect a quiz every week. (I will drop the lowest quiz mark)
  - Must be done in the class, doing it from outside the classroom is an academic misconduct and will result in zero mark and sighing a minor offence.
- **Midterm**:
  - The exam will be on May. 27 during the class time.
  - No midterm deferral, marks will be added to the final exam

Course description

This course introduces students to methods and tools for software security and dependability, reliability engineering process, and fault tolerance. Topics include software security and privacy, software vulnerabilities and attacks, access control models, identity and access management, security engineering process and the secure software development lifecycle, run-time software monitoring, principles of software dependability techniques, software fault tolerance, error-resilient computing.

Learning Outcomes

On the successful completion of the course, students will be able to:

- Explain the main concepts and tools of software and computer securities.
- Describe appropriate techniques to tackle software and computer security risks.
- Understand authorization, authentication, and access control.
- Understand how reliability, safety, and resilience contribute to dependable systems.
- Design a dependable system.

Course Outline

- This schedule may change, depends on class progress.

Week of	Topic	Other Info.
May 05	Overview of Software Computer Security	
May 12	Cryptographic Tools	
May 19	User Authentication, Authorization & Access Control	
May 26	Database, Buffer overflow and Software security	Midterm May 27
June 02	Dependability and security	
June 09	Security engineering	

Project

- **Objective**: the students will learn how to research a recent topic in software security and dependable systems and write a research paper (10-15 pages) that covers the main aspects of the technologies involved in this field. The paper should summarize and organize recent research results in a novel way that integrates and adds understanding to the work in the field. The group project is an important part of this course since it enables you to learn new things and apply the concepts and technologies and utilizes many of the concepts presented in class.

- **Teams**: you must do this project in a group of 3-4 students. Please join a group on Canvas.

Project

- **Distribution of marks:**
  - Research paper: 70%.
  - Presentation: 30%.

- **Deadline:**
  - Submit your group members' names (and ID's) and project title on Canvas by May 18, 2025.
  - Project due date is June 8th, 2025.