CSCE 4565/5565: Secure Software Systems  
Course Syllabus

This course covers: Fundamentals and techniques to design and implement software systems. Assessment of security vulnerabilities in software systems, exploitation of software vulnerabilities, and methods to secure vulnerable software. Secure coding practices, data analytics for security, microservices and cloud services security. Reverse engineering and security assessment of cyber-physical systems.

Department: Department of Computer Science and Computer Engineering  
Credit Hours: 3  
Current semester and year (start to end date): Fall 2023 (August 21 - December 15)

Format: face-to-face  
Meetings schedule: Section 2 - Th 5:30 to 8:10 pm in Gab 104  
Section 3 - Wed 8:30 to 11:20 am in K150

Instructor: Dr. Lotfi ben Othmane  
Office: Discovery Park E235R  
Email: lotfi.benothmane@unt.edu  
Office hours: Wed 2:00 - 4:00 pm and Fr 10:00 am to 12:00 (or arranged by emails)

Course Goals and Learning Objectives:

The goal of the course is to provide students with the knowledge and first-hand experience they need to develop secure software. The students will get familiar with exploiting software vulnerabilities and will experiment with the techniques to design secure software and to ensure the security of developed software. In addition, they will learn to use of empirical research methods to study software security challenges.

At the end of the course, the students will be able to:
- Assess the security in vulnerable software systems
- Exploit software vulnerabilities
- Apply best practices in secure software development
- Build effective cryptographic-based functionalities and assess their vulnerabilities
- Assess security implications for emerging software technologies.

Course Materials:

There is no textbook. A set of papers and chapters will be distributed.

Learning Activities:

To successfully complete this course, students will do the following:

- Attend the lectures or watch the recorded lectures.
- Watch additional media.
- Participate in discussion topics.
- Participate in assigned group projects.
• Complete quizzes and exams.
• Complete the project.

Assessments

**Labs on software attacks** - There will be 3 or 4 lab exercises that have equal weights. The labs work on Windows-based computer only. The labs count 25% of the grade.

**Assignments** - There will be 3 practice assignments that have equal weights. The assignments count for 20% of the final grade.

**Project** - Each pair of students should practice their knowledge in assessing the security of an open-source software or work on a research topic related to software security and submit a report at the end of the semester. The project counts 25% of the final grade.

**Quizzes** - There will be a set of quizzes that have equal weights, almost one quiz for each module. The dates of the quizzes will be announced as we progress in the semester. The quizzes count 30% of the final grade. Every student will have the opportunity to exclude their lowest quiz score or the score from a quiz they were absent for.

We will discuss security news every two weeks in class. The quizzes can include questions derived from the discussions.

There will be various in-class activities. On certain occasions, students will be invited to come up to the board, solve problems, and get consequently rewarded with quiz bonus points.

**Grading Policies:**

The grading scheme is:

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<thead>
<tr>
<th>Name</th>
<th>Range</th>
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<tbody>
<tr>
<td>A</td>
<td>93% to 100%</td>
</tr>
<tr>
<td>B</td>
<td>83% to &lt;93%</td>
</tr>
<tr>
<td>C</td>
<td>73% to &lt;83%</td>
</tr>
<tr>
<td>D</td>
<td>65% to &lt;73%</td>
</tr>
<tr>
<td>F</td>
<td>&lt;65%</td>
</tr>
</tbody>
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**Grade Appeal Process:**

If you become concerned about the class management, please communicate your concerns with your instructor. Concerns sometimes relate to grading methods, paper turnaround time, and course policies, as examples.

Students have 7 days after returning the grades to contest their scores. Requests that come after 7 days will be ignored.
Course Policies:

Feedback: All graded assessments will be returned with feedback within 10 days of the due date, when possible. Personalized feedback will be provided for each assignment and reflection. In addition, responses to common questions and unclear content will be posted at the conclusion of each module. Comments will be posted at the conclusion of each discussion.

Unclaimed student quiz sheets will be discarded one week after they are returned in class.

Missed and late coursework. It is important to keep up with the pace of this course, therefore late submissions will be reduced by a penalty of 5% for each late day up to 5 days.

Make sure to keep careful track of submission deadlines for all of your work in this class.

Attendance: Attendance is not required.

Expectations

- Each student should have laptop that they could use for the in-class activities.
- Students are expected to focus on the lecture during the course sessions.