Syllabus for CYB785 Cyber-Physical Systems Security

NOTE: This syllabus document contains the basic information of this course. The most current syllabus is available in the full course.

Course Description
Covers the fundamentals and techniques to design and implement cyber-physical systems. Topics include the architecture of cyber-physical systems, exploiting software vulnerabilities, secure coding, microservices security, cloud services security, reverse engineering, security assessment of cyber-physical systems, and data analytics for security.

Prerequisite(s)
CYB 775

Program Outcomes
This course addresses the following competencies and program outcomes of the Masters of Science in Cybersecurity:
- Program Outcome 1: Implement best practices in secure software development
- Program Outcome 2: Implement effective cryptographic systems and assess their vulnerabilities
- Program Outcome 3: Assess security implications for emerging software technologies

Course Outcomes
Upon completing this course, you will be able to do the following:
1. Describe properties and characteristics of cyber-physical systems
2. Analyze and identify security and privacy issues in different types of cyber-physical systems
3. Perform cyber-physical system risk management activities, including vulnerability analysis, threat modeling, and mitigation planning, using standard methodologies
4. Identify emerging technologies and applications within cyber-physical systems along with their associated security implications

Course Components

Quizzes
Every even-numbered module will contain a quiz covering content from the last two modules.

Discussions
The purpose of discussions is to engage in critical reflection and dialogue with classmates regarding course content.

Assignments
Assignments provides opportunities to apply course knowledge to real-world applications.
Course Project: CPS Risk Mitigation Plan

This series of course projects will lead you through the process of creating a risk mitigation plan for a cyber-physical system. Along the way, you will be asked to enhance the authenticity of your experience by considering the workplace context in which a risk mitigation assignment would take place. Finally, there will be many opportunities for you to receive feedback from your peers.

Grading

The following grading scale will be used to evaluate all course requirements and to determine your final grade:

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<thead>
<tr>
<th>Grade</th>
<th>Percentage Range</th>
<th>Assignment</th>
<th>Percent of Final Grade</th>
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<tr>
<td>A</td>
<td>&gt;94%</td>
<td>Discussions (8)</td>
<td>15%</td>
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<td>&gt;90%</td>
<td>Quizzes (6)</td>
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<td>Assignments (4)</td>
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<td>Course Project (Parts 1-4)</td>
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