



# Syllabus for CYB785 Cyber-Physical Systems Security

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**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:

Grade	Percentage Range
<b>A</b>	>94%
<b>A-</b>	>90%
<b>B+</b>	>87.5%
<b>B</b>	>85%
<b>B-</b>	>80%
<b>C+</b>	>77.5%
<b>C</b>	>70%
<b>C-</b>	>65%
<b>F</b>	<65%

Assignment	Percent of Final Grade
Discussions (8)	15%
Quizzes (6)	15%
Assignments (4)	20%
Course Project (Parts 1-4)	35%
Course Project (Final)	15%
<b>Total Percent</b>	<b>100%</b>