

STUDENT WARNING: This course syllabus is from a previous semester archive and serves only as a preparatory reference. Please use this syllabus as a reference only until the professor opens the classroom and you have access to the updated course syllabus. Please do NOT purchase any books or start any work based on this syllabus; this syllabus may NOT be the one that your individual instructor uses for a course that has not yet started. If you need to verify course textbooks, please refer to the online course description through your student portal. This syllabus is proprietary material of APUS.

ISSC478

Course Summary

Course: ISSC478 **Title:** SCADA Risk Management

Length of Course : 8

Prerequisites : ISSC477 **Credit Hours :** 3

Description

Course Description:

This course provides an overview of the architecture of Industrial Control Systems (ICS) and Supervisory Control and Data Acquisition (SCADA) systems and how these systems can be secured. Students will explore issues such as planning and developing an ICS/SCADA network, learn about PLC devices and their role in these systems, diagramming and ensuring secure communications and operations, and implementing security standards.

Course Scope:

This course provides an overview into risk management techniques used in securing Industrial Control Systems (ICS) and Supervisory Control and Data Acquisition (SCADA) systems. Students will explore how the unique equipment in these systems affect an otherwise standard risk assessment and risk management strategy for the average enterprise network. Students will also learn the different mitigation techniques that can be implemented to mitigate the identified risks. (Prerequisite: ISSC477)

Objectives

O-1: Understand the latest security standards for the protection of ICS and SCADA systems

O-2: Recognize the different types of threats and vulnerabilities that are unique to ICS and SCADA systems

O-3: Recognize devices such as PLCs and the role that they play in ICS and SCADA systems

O-4: Examine the unique differences in securing ICS and SCADA systems versus standard enterprise networks

Outline

Week 1: ICS, SCADA, PLC, What do these all mean?

Learning Objectives:

O-2: Recognize the different types of threats and vulnerabilities that are unique to ICS and SCADA systems

O-3: Recognize devices such as PLCs and the role that they play in ICS and SCADA systems

Reading(s)

Please check the course e-reserve for weekly readings.

Assignment(s)

Wk1 Assignment: Accident Investigation

W1:Introduction Discussion

Week 2: IoT Basic Electronics

Learning Objectives:

O-3: Recognize devices such as PLCs and the role that they play in ICS and SCADA systems

Reading(s)

Please refer to the course e-reserve for weekly assigned readings.

Assignment(s)

W2 Assignment: Projects 0,1,2,3

Week 3: Projects and PLC Learning

Objectives:

O-3: Recognize devices such as PLCs and the role that they play in ICS and SCADA systems

Reading(s)

Please refer to the course e-reserve for weekly assigned readings.

Assignment(s)

W3: Assignment – Projects 4,5,6

Week 4: Projects

Learning Objectives

O-3: Recognize devices such as PLCs and the role that they play in ICS and SCADA systems

Reading(s)

Please refer to the course e-reserve for weekly assigned readings.

Assignment(s)

Discussion: Critical Infrastructure Sector

W4 Assignment: Projects 7,8,9

Week 5: Attack for ICS

Learning Objectives:

O-1: Understand the latest security standards for the protection of ICS and SCADA systems

O-2: Recognize the different types of threats and vulnerabilities that are unique to ICS and SCADA systems

O-3: Recognize devices such as PLCs and the role that they play in ICS and SCADA systems

O-4: Examine the unique differences in securing ICS and SCADA systems versus standard enterprise networks

Reading(s)

Please refer to the course e-reserve for weekly assigned readings.

Assignment(s)

W5 Assignment: Attacking and/or hacking a PLC

Week 6: PLC Ladder Logic

Learning Objectives:

O-3: Recognize devices such as PLCs and the role that they play in ICS and SCADA systems

O-4: Examine the unique differences in securing ICS and SCADA systems versus standard enterprise networks

Reading(s)

Please refer to the course e-reserve for weekly assigned readings.

Assignment(s)

W6 Assignment: Program PLC using Ladder Logic

Week 7: ICS Security Architecture

Learning Objectives:

- O-1: Understand the latest security standards for the protection of ICS and SCADA systems
- O-4: Examine the unique differences in securing ICS and SCADA systems versus standard enterprise networks

Reading(s)

Please refer to the course e-reserve for weekly assigned readings.

Assignment(s)

W7 Discussion: Comparing Devices

Week 8: Communication Protocol Comparison

Learning Objectives:

- O-3: Recognize devices such as PLCs and the role that they play in ICS and SCADA systems
- O-4: Examine the unique differences in securing ICS and SCADA systems versus standard enterprise networks

Reading(s)

Please refer to the course e-reserve for weekly assigned readings.

Assignment(s)

Week 8 Discussion: Course Feedback W8 Assignment: Communication Protocols

Evaluation

Assessment Components

Discussions (4)	20%
Assignments (3)	33%
Projects (3)	33%
Ladder Assignment	14%

Materials

Materials are provided inside the classroom through the course e-reserve. [https://lgapi-](https://lgapi-us.libapps.com/widgets.php?site_id=1192&widget_type=10&output_format=1&widget_embed_type=2&course_id=87437&enable_navigation=1&config_id=1648498066508#)

[us.libapps.com/widgets.php?site_id=1192&widget_type=10&output_format=1&widget_embed_type=2&course_id=87437&enable_navigation=1&config_id=1648498066508#](https://lgapi-us.libapps.com/widgets.php?site_id=1192&widget_type=10&output_format=1&widget_embed_type=2&course_id=87437&enable_navigation=1&config_id=1648498066508#)

Course Guidelines

Communications

Student Communication

To reach the instructor, please communicate through the MyClassroom email function accessible from the Classlist of the Course Tools menu, where the instructor and students email addresses are listed, or via the Office 365 tool on the Course homepage.

- In emails to instructors, it's important to note the specific course in which you are enrolled. The name of the course is at the top center of all pages.
- Students and instructors communicate in Discussion posts and other learning activities.
- All interactions should follow APUS guidelines, as noted in the [Student Handbook](#), and maintain a professional, courteous tone.
- Students should review writing for spelling and grammar.
- [Tips on Using the Office 365 Email Tool](#)

Instructor Communication

The instructor will post announcements on communications preferences involving email and Instant Messaging and any changes in the class schedule or activities.

- Instructors will periodically post information on the expectations of students and will provide feedback on assignments, Discussion posts, quizzes, and exams.
- Instructors will generally acknowledge student communications within 24 hours and respond within 48 hours, except in unusual circumstances (e.g., illness).
- The APUS standard for grading of all assessments (assignments, Discussions, quizzes, exams) is seven days or fewer from the due date.
- Final course grades are submitted by faculty no later than seven days after the end date of the course or the end of the extension period.

University Policies

Consult the [Student Handbook](#) for processes and policies at APUS. Notable policies:

- [Drop/Withdrawal Policy](#)
- [Extension Requests](#)
- [Academic Probation](#)
- [Appeals](#)
- [Academic Dishonesty / Plagiarism](#)
- [Disability Accommodations](#)
- [Student Deadlines](#)
- [Video Conference Policy](#)

Mission

The [mission of American Public University System](#) is to provide high quality higher education with emphasis on educating the nation's military and public service communities by offering respected, relevant, accessible, affordable, and student-focused online programs that prepare students for service and leadership in a diverse, global society

Minimum Technology Requirements

- Please consult the catalog for the minimum hardware and software required for [undergraduate](#) and [graduate](#) courses.
- Although students are encouraged to use the [Pulse mobile app](#) with any course, please note that not all course work can be completed via a mobile device.

Disclaimers

- Please note that course content – and, thus, the syllabus – may change between when a student registers for a course and when the course starts.
- Course content may vary from the syllabus' schedule to meet the needs of a particular group.