Introduction to cybersecurity concepts

**Module Description:** This module provides students fundamental knowledge of cybersecurity. It is broken into two micro modules: computer security overview, identification authentication and access control. Computer security overview lists basic terminologies of cyber security. Identification and authentication are discussed with an emphasis on different authentication methods. Access control methods are introduced as well.

**Prerequisite Knowledge:**  Students are expected to have knowledge of computer systems.

**Length of Completion**: This module includes 2 micro modules. The total length of the module is around 6 hours.

**Level of Instruction:** This module intended for upper division undergraduate students majoring in computer science or computer engineering.

**Learning Setting:** This module is suitable for many forms of delivery: online/in-class/hybrid.

**Lab Environment:** None

**Activity/Lab Tasks:** There will be in-class discussion and an out-of-class written assignment.

**Lab Files that are Needed:** None

# learning outcomes

MODULE learning oUTCOMES

• Students will be able to list the fundamental concepts of Cybersecurity.

* Students will be able to describe the CIA triad.
* Students will be able to distinguish between vulnerability, threat, risk and attack.
* Students will be able to understand different authentication methods.
* Students will be able to understand how to pick strong passwords.
* Students will be able to describe different identifications methods.
* Students will be able to understand different access control models.
* Students will be able to apply proper access control model to a system

# module Details

**Instructional Files and Online Resources that are Needed:**

Slides:

Lesson 1: Computer Security Overview (CSP-M1-L1.pptx)

Lesson 2: Identification, Authentication, and Access Control (CSP-M1-L2.pptx)

**Assessment:**

Written homework questions (CSP-HW1.docx)

# lessons

**Overview of Lessons:**

Lesson 1 Computer Security Overview

Lesson 2 Identification, Authentication, and Access Control

**Lesson 1 Learning Outcomes:**

Upon completion of this lesson:

* Students will be able to understand the concepts of cybersecurity.
* Students will be able to describe the CIA triad.
* Students will be able to distinguish between vulnerability, threat, risk and attack.

**Lesson 1 Details:**

**Warm Up:**

Instructor self-introduction

Some recent real-world malicious attacks to get students focused on the importance of Cyber Security.

**Lesson:**

Topics to be covered in this lesson include:

* Cyber security, computer system, vulnerability, threat, control, countermeasure, attack, harm, CIA triad etc.

**Active Learning Activity:**

Discussion:

Ask students about the vulnerabilities, attacks, breaches they have heard before.

Ask students how they keep the information on their laptops/desktops safe.

**Lesson 2 Learning Outcomes:**

Upon completion of this lesson:

* Students will be able to understand different authentication methods.
* Students will be able to understand how to pick strong passwords.
* Students will be able to describe different identifications methods.
* Students will be able to understand different access control models.
* Students will be able to apply proper access control model to a system based on its requirement.

**Lesson 2 Details:**

**Warm Up:**

Ask students what are the authentication methods that we are using in our daily life?

**Lesson:**

Topics to be covered in this lesson include:

* Identification, identifier
* Authentication
* Password, brute force attack, rainbow table, salt.
* Access control principles, subjects, objects, access rights
* Access control methods (MAC, DAC, RBAC)
* access control list, access control matrix

**Active Learning Activity:**

Discussion:

What are the identifiers that we use to identify ourselves?

What kind of passwords are strong passwords?

Please attribute Dr. Jim Alves-Foss and Dr. Jia Song, University of Idaho  
  
  
  
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