

Cybersecurity Decision Making Simulation

Module Learning Outcomes: (Please include explicit references to the submitted Grant Learning Outcomes – Appendix 3). This instructional module will provide the student with knowledge and praxis in:

1. Demonstrate substantial understanding of the cybersecurity first principles.
2. Explain different types of attacks on computing systems
3. Engage in scenario-based learning that allows them to make educated decisions and take deliberate action online to prevent things from going wrong in the first place.
4. Exemplify the ability to identify the authenticity and credibility of access requests.
5. Develop skills needed to defeat various mal- and social engineering attacks.
6. Apply the knowledge gained in solving real-world, scenario-based problems.
7. Remember the important role humans play in the digital world and understand how to minimize accidental and intentional human errors

The Module addresses the following First Principles: (Please include explicit references to the First Principles - Appendix 1). All of the Cybersecurity First Principles will be involved in developing policy options for the decision maker, but the following are specifically the ones most relevant to the teams' consideration:

#1 - Domain Separation: separate areas of control.

#2 - Process Isolation: separating processes in a system so that a problem in one does not affect any others

#4 – Least Privilege: allows the minimum number of privileges necessary to accomplish the task.

#6 – Abstraction: removes any clutter that can distract and possibly be used in an incorrect way and only provides the minimum information necessary to accomplish the task.

Description:

This decision making simulation addresses the least privilege, process isolation and abstraction first principles of security by illustrating the essential role and fallibility of the human user in cybersecurity. The exercise demonstrates the ambiguity of the origin and intention of interruption to and/or corruption of digital media using a simulated "real world" situation. Participants in the exercises take on the role of advisors to a senior-level decision-maker (Secretary of Defense) in a group deliberative process where the principal task is to finalize advice for a formal deliberative/decision-making meeting on recommendations for the President on possible short-term technical solutions to a set of pressing cyberspace security problems that emerge in the context of a future political-military crisis.

learner-centered classroom:

The camp participants will be divided into collaborative teams of teachers and students competing against each other to develop the best advice for the short-term technical solutions to the simulation's set of pressing cyberspace security problems. Each camp participant will be

provided major features of the international security environment, the infrastructure security environment, and a set of instructions the day before the simulation to familiarize them self with the situation at the beginning of the exercise. A situation report outlining a crisis will be given to each team at the start of the exercise for them to deliberate recommendations to the Secretary of Defense.

Assessment:

Each team of teachers and students will be provided an “adviser” to offer international security advice in their deliberations. At the conclusion of the exercise, each team will present their advice to the decision maker and the advisors will compare the character and results of their deliberations to determine their ranking.

Suitability to various groups:

The international security material in this module may be too advanced for middle school students but they should be able to participate fully given the material provided the day before the exercise and as part of the collaborative student-teacher structure of the simulation. Even though possibly introducing unfamiliar material, the high school students and teachers should be able to grasp it relatively quickly given the pre-simulation provided material.

How the Teachers and Students groups will be interacting:

It is envisioned that the students will have the most active role in the collaborative deliberations of the simulation. One should assume the role of the group’s chair and organize the rest of the students to examine different aspects of the situation provided in the “situation report” that specifies the “crisis” to which they are responding. The teachers will serve as advisers to the students assigned to their groups and help direct the chair and other student participants in their assigned tasks.