**CS 571 Case Studies in Computer Security**

**Spring 2022**

**Instructor:**

Dr. Beth Wilson

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**Textbook (and/or other Required Materials):**

There are no textbooks for this class. All assigned reading material will be provided as PDF files in the Files tab of the Canvas course site.

**Course Description:**

This course examines security challenges and failures holistically, taking into account technical concerns, human behavior, and business decisions. Using a series of detailed case studies, students will explore the interplay among these dimensions in creating secure computing systems and infrastructure.

**Prerequisite Courses:**

A prior course or equivalent experience in technical aspects of computer security, at either the software or systems level.

**Learning Outcomes:**

By the completion of this course, learners will be able to:

1. Explain the technical aspects of a cyber-attack with a holistic view.
2. Describe incident contributors and understand the impact of technical concerns, human behaviors, and business decisions.
3. Analyze a cyber-attack to identify lessons learned and future actions to prevent a similar attack.
4. Understand the significance of the selected case studies and the issues they raised.

**Communication:**

Here are the ways to contact me:

* Email – You can expect a response within 24 to 48 hours.
* Question and Answer Forum (pinned on the Discussion tab) – This is where I will respond to general questions about the course material, lectures, assignments, and expectations within 24 to 48 hours.
* Microsoft Teams – When I am online, I will activate Microsoft Teams so that you can initiate a chat in Teams.
* Quizzes are graded automatically when you complete them. I will provide feedback on individual and team assignments within 1 week.

There are no set office hours. I am open to scheduling a virtual live meeting if requested.

**Course Approach:**

This course is a fully asynchronous online course:

* Weeks begin on Monday and close Sunday at 11:59 pm.
* All times are Worcester, MA time (East coast time).
* All material is on the WPI Canvas learning management system.
* Course starts Monday 1/17/2022 and ends Sunday 4/24/2022.

The course will span 14 weeks focusing on 11 different case studies and 11 related topics. The lectures introduce the assigned reading and provide context for the week. The knowledge check quizzes cover the week’s content and individual exercises apply concepts. In weeks 3 through 13, there is a discussion board topic. Teams of students will select a case study not part of this class to analyze and prepare a written report and a presentation package.

The class will analyze and discuss real-world examples and their impact. There are individual and team assignments to apply this analysis. Each week you should expect to spend between 10-14 hours completing the reading, lectures, and assignments.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Start  MON** | **Case Study** | **Related Topic** | **Team  Project** | **Due SUN 11:59pm** |
| **1** | 1/17 |  | Introduction to Cyber Security NIST 800-12 |  | 1/23 |
| **2** | 1/24 | Maroochy Water Services | Insider Threat  SEI Report | Form Teams | 1/30 |
| **3** | 1/31 | Estonia | Distributed Denial of Service CIS Guide | Selected Case Study and  Team Plan | 2/6 |
| **4** | 2/7 | Natanz Nuclear Fuel Enrichment Plant | Industrial Control Systems Security NIST 800-82 |  | 2/13 |
| **5** | 2/14 | RSA Security |  | Report Part 1 | 2/20 |
| **6** | 2/21 | Target Corporation | Malware Incident Prevention NIST 800-83 |  | 2/27 |
| **7** | 2/28 | Energy Firms | Supply Chain  NIST 800-161 |  | 3/6 |
| **8** | 3/7 | JP Morgan Bank |  | Report Part 2 | 3/13 |
| **9** | 3/14 | Office of Personnel Management | Personally Identifiable Information NIST 800-122 |  | 3/20 |
| **10** | 3/21 | Dyn | IoT Device Security  NIST 800-213 |  | 3/27 |
| **11** | 3/28 | Ukraine Power Grid |  | Report Part 3 | 4/3 |
| **12** | 4/4 | Garmin | Ransomware  CIS Guide |  | 4/10 |
| **13** | 4/11 |  | C-Suite Business Case | Presentation Package | 4/17 |
| **14** | 4/18 |  | Cyber Resiliency |  | 4/24 |

**Course Requirements:**

1. **Grade Determination Breakdown**

Assignments are weighted by group:

|  |  |  |
| --- | --- | --- |
| **Type** | **Assignments** | **Percentage of Grade** |
| Individual | Discussion Board | 30% |
| Knowledge Check Quizzes | 20% |
| Homework and Exercises | 25% |
| Team Assessment of Contribution to Team Project | 5% |
| Team | Team Project | 20% |
| **Total** | | **100%** |

1. **Assignments**

All assignments are in Canvas and organized based on the tab selected:

* + - Module tab: organized in instructor preferred order of completion
    - Assignments tab: organized based on “show by” selection at top:
      * Date: ordered by due date
      * Type: ordered within percentage of grade groups
    - Syllabus tab: organized by due dates

Rubrics for each assignment will be used to determine the grade for the completed work.

All assignments are due Sunday at 11:59pm. The discussion boards have an initial interim deadline of Friday at 11:59pm for the initial post.

Knowledge check quizzes and exercises using the Canvas quiz tool provide immediate feedback. All assignments will be graded within a week.

1. **Late Work Policy**

Knowledge check quizzes, exercises, and discussion boards will close at the deadline and no late work is accepted. Individual homework assignments and team submissions will be closed at the deadline unless an extension has been discussed with the instructor in advance of the deadline and authorized by the instructor in the form of a revised deadline in Canvas.

1. **Class Participation Expectations and Criteria**

The rubric for the discussion board participation is as follows:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Quality of**  **Initial Post** | 5:  All 5 of the following:  (1) Initial post by Sunday,  (1) Answers all items in question,  (1) Good application of course content,  (1) Meaningful connections,  (1) Easy to follow | 4:  4 of the 5 criteria satisfied | 3:  3 of the 5 criteria satisfied | 2:  2 of the 5 criteria satisfied | 1:  Initial post by Sunday (11:59 Eastern time) | 0:  No post to discussion board |
| **Initial Post**  **By Friday** | 1:  Initial post by interim deadline (Friday 11:59 pm Eastern time) | | | 0:  Initial post Saturday or Sunday | | |
| **Replies** | 4:  All 4 of the following:  (1) reply to 1 student,  (1) reply to 1st student is meaningful,  (1) reply to 2nd student,  (1) reply to 2nd student is meaningful  *NOTE: reply in 2 different student threads, not initial post thread, not replies to 2 students in 1 thread* | | 3:  3 of the 4 reply criteria satisfied | 2:  2 of the 4 reply criteria satisfied | 1:  Reply to 1 student in their thread (not initial post thread) | 0:  No replies |

**Technical Requirements:**

All material is accessible by Canvas through a web browser. If you experience technical difficulties with Canvas, you can use the “help” button to access 24x7 help resources.

If you require further assistance, you can contact the Help Desk at helpdesk@wpi.edu or 508.831.5888.

**Library Access:**

As a student at WPI, you have access to a variety of resources through the library. Use the link [here](https://www.wpi.edu/library) to access databases, e-journals, and/or e-books. You will be required to log in with your WPI username and password to access materials.

**POLICIES**

**Academic Integrity:**

You are expected to be familiar with the *Student Guide to Academic Integrity at WPI* that is downloadable from [here](https://www.wpi.edu/sites/default/files/docs/Offices/Marketing-Communications/AIStudentguide2019-2020-pages.pdf). Consequences for violating the Academic Honest Policy range from earning a zero on the assignment, failing the course, or being suspended or expelled from WPI.

Common examples of violations include:

* Copying and pasting text directly from a source without providing appropriately cited credit
* Paraphrasing, summarizing, or rephrasing from a source without providing appropriate citations
* Collaborating on individual assignments
* Turning in work where a good portion of the work is someone else’s, even if properly cited

**Academic Accommodations:**

We at WPI strive to create an inclusive environment where all students are valued members of the class community. If you need course adaptations or accommodations because of a disability, or if you have medical information to share with us that may impact your performance or participation in this course, please make an appointment with us as soon as possible. Students with approved academic accommodations should plan to submit their accommodation letters through the [Office of Accessibility Services Student Portal](https://nam03.safelinks.protection.outlook.com/?url=https%3A%2F%2Fclockwork.wpi.edu%2FClockWork%2Fcustom%2Fmisc%2Fhome.aspx&data=02%7C01%7Ckmarengo%40wpi.edu%7C22931e2c6d094dc8c5b008d82e704f79%7C589c76f5ca1541f9884b55ec15a0672a%7C0%7C0%7C637310407186155797&sdata=cUDQvp%2FujLQggSxO%2BKZISnaJW0E5llOq2qEJ1C67u3k%3D&reserved=0). Should you have any questions about how accommodations can be implemented in this particular course, please contact me as soon as possible. Students who are not currently registered with the Office of Accessibility Services (OAS) but who would like to find out more information regarding requesting accommodations and what that entails should plan to contact them via:

**Email:** [**AccessibilityServices@wpi.edu**](mailto:AccessibilityServices@wpi.edu) **and/or Phone: (508) 831-4908.**

**On Campus – Daniels Hall, First Floor 124**

**Grading Policy:**

Final course grades are based on a student’s performance as follows:

|  |  |
| --- | --- |
| Letter Grade | Percentage |
| A | 90 - 100 |
| B | 80 - 89 |
| C | 70 - 79 |
| D | 60 - 69 |
| F | < 60 |

Course incompletes may be granted if the major part of the course is completed; however, no additional credit can be given for missed class discussions or teamwork beyond the end of the course. In addition, in the case of an incomplete, the student is responsible for handing in the final work within the WPI required timeframe of one (1) year. After this time, an incomplete grade changes to a failing (F) grade.