Course program and reading list

Semester 3 Year 2024

School: Lauder School of Government, Diplomacy & Strategy M.A

Technical Aspects of Cyber-Security

Lecturer:

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Teaching Assistant:

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Course No.:	Course Type :	Weekly Hours :	Credit:
24157	Lecture	4	4

Course Requirements :	Group Code :	Language:
Final Paper	243241571	English

Course Description

The digital revolution, including the internet, mobile, cloud and social networks, have brought with them many opportunities and challenges, along with legal, ethical, and psychological dilemmas. Cyber attacks are recognized as one of the most serious security challenges faced today by nations, and as an example "Keep America safe in the cyber era" is one of the pillars in the National Security Strategy of USA document published December 2018. In addition, the level of cyber threats is rising. Thus, organizations must be prepared to defend against threats in cyberspace, and decision-makers must be familiar with the fundamental principles and best practices of cyber security required to protect their enterprises.

The course is geared toward participants at the decision-making level who need a broad security overview, and its goal is to provide an introduction to cyber-security. In the course we will discuss the main concepts of cyber-security, how to define and manage

an organizational cyber-security policy. In addition, we will review how security is implemented in operating systems, databases, software, networks, the web, the cloud, and mobile devices. Security approaches will be classified into prevention, detection and tolerance, and both the defense and the attacker perspectives will be addressed.

(Note: the course is developed such that no prerequisite is needed to take this course.)

Tentative lectures plan: (each lecture is 4 academic hours):

- Introduction to cyber-space and information technology (1 lecture)
- Introduction to Information security - terminology (1 lecture)
- Information security mechanisms overview & concepts (1 lecture)
- Introduction to cryptography and how it is used to ensure data confidentiality and data integrity (2 lecture)
- Introduction to Authentication (1 lecture)
- Introduction to Authorization (1 lecture)
- Introduction to cyber attacks and adversaries (1 lecture)
- Malware taxonomy (e.g. Trojan horses, viruses, worms) (1 lectures)
- Malware payload categories (e.g. ransomware, RAT, financial malware) (1 lecture)
- Intrusion detection and prevention system (1 lecture)
- Cloud and mobile security (1 lecture – if time permit)

Course Goals

The course will provide the students understanding of:

- The technical aspects of cyber security
- The types and categories of cyber adversaries
- The types and categories of cyber attacks on organizations
- The types and categories of malware
- The risks to an organization due to a cyber security attacks
- The technologies, products, policies and procedures that can help mitigating those risks and foster secure, resilient, and reliable operations in the cyber space.
- The process of developing, implementing, and managing an organizational cyber-security program, and how to adjust system protections and responsive actions over time in a changing threat environment.

Grading

The course final grade will be composed from:

- final paper - 55%
- Quiz – 25%
- Class presentation - 20%

Learning Outcomes

At the end of the course the student should be able to:

- Describe the information security properties of an information system in the cyber era that should be protected
- Describe cyber-adversaries and their motivation
- Describe cyber-attacks and the potential risks to organizations due to cyber attacks
- Describe the various types of malware (e.g. worms, viruses, trojans, etc.)
- Describe the information security technologies and products that can be used to mitigate cyber attacks
- Delineate how to defend against the different cyber attacks using the relevant technologies and products

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Lecturer Office Hours

After each of the classes.

Tutor Office Hours

NA

Teaching Assistant

TBD

Additional Notes

Students are required to attend all classes and any assigned supplementary activities related to the course. Classes will consist of lectures and discussions.

The date of the quiz will be annonced after the first lectures.

The presentation on class (zoom) will be on the last meeting on September 6th.

There will be a final paper at the end of the semester

Reading List

There is no text book for the course as it will cover many different subjects.

The presentations used in the course lectures will be detailed and should be used as a basis for learning the topics learned in the course. The lectures presentations will be uploaded to the course web site before each lecture.

In addition, I will upload to the course web site additional research papers and other relevant material, and the students are asked to read these papers as preparation to the lectures.