

**2016/17 Assessment Report on
Basic Certificate - Fundamentals of Cybersecurity
(by Melody Moh, May 2017)**

1. Overview of Main Work Accomplished:

- a) Revised program educational objective
- b) Revised Program Learning Outcome (PLO) to be inline with the PLO proposed by ABET for cybersecurity programs.
- c) Implemented proposed improvements:
 - i. Online, electronic application of the certificate.
 - ii. Certificate website included detailed online application steps.
- d) Reached the estimated number of students earning the certificate (target number is 15).
- e) Designed an exit survey for more effective assessment.

2. Program Educational Objective – Revised

The undergraduate cybersecurity certificate program provides students with a well-grounded foundation to become professionals in software security and information assurance.

3. Course Work

Take one course from each of the rows in the table below:

Courses	Units
CS/SE 146 Data Structures and Algorithms	3
CS/SE 149 Operating Systems	3
CS/SE 157A Introduction to Database Management Systems	3
CS 158A Computer Networks or SE 148 Computer Networks I	3
CS/SE 158B Computer Network Management: Principles and Technology	3
CS/SE 166 Information Security	3

4. Program Learning Outcomes (PLO) – Revised

Upon successful completion of the certificate curriculum, students will be able to:

- (a) apply security principles and practices to the environmental, hardware, software, and human components of a system
- (b) analyze and evaluate systems with respect to maintaining operations in the presence of risks and threats

5. PLO supported by Certificate Courses - Revised

	PLO (a)	PLO (b)
CS/SE 146	X	
CS/SE 149	X	
CS/SE 157A	X	
CS 158A or SE 148	X	X
CS/SE 158B	X	X
CS/SE 166	X	X

6. Number of Students Received Certificate in 2016/17

Semester	Number of Students	Notes
Fall 2016	10	Certificates signed
Spring 2017	8 (Estimated)	Course grades unavailable, students cannot turn in application form.

7. Estimated Number of Students Receiving Certificate

Year	Estimated Number of Students Receiving Certificate
2017/18	20
2018/19	25
2019/20	30
2020/21	35
2021/22	35

8. Assessment Plan (Revised)

We plan to assess the certificate by requiring all students applying for the certificate to participate in an exit-survey:

For all questions, students will be asked to select one of the following:

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

Assessing PLO (a):

An ability to apply security principles and practices to the environmental, hardware, software, and human components of a system.

- a. *I understand the properties of confidentiality, integrity, availability, and their importance in the design of software and systems.*
- b. *I am familiar with the different types of cryptographic algorithms, including symmetric-key ciphers, public-key cryptography, and cryptographic hashes.*
- c. *I understand how firewalls can improve the security of a system, and I understand the trade-offs between different types of firewalls such as packet filters and application proxies.*
- d. *I know appropriate techniques for choosing strong passwords and I am familiar with the proper tools for securely storing user passwords.*

Assessing PLO (b):

An ability to analyze and evaluate systems with respect to maintaining operations in the presence of risks and threats.

- a. *I understand how software bugs relate to security vulnerabilities. I am familiar with software-based attacks and reverse engineering.*
- b. *I am familiar with different types of malware, such as worms, backdoors, and Trojan horses.*
- c. *I know different strategies for detecting malware and the trade-offs among different approaches.*
- d. *I am familiar with different security protocols and how to use them as part of a secure system.*

9. Proposed Improvements

The following is a list of proposed improvements:

- a) Improve the certificate website to include the revised Program Educational Objective and the revised PLO.
- b) Implement the exit survey for assessment (online, web-based).
- c) To survey also students' next steps (landing a job – the job title/function and company, graduate/professional school, etc.).