**CYENG 312: Trusted Operating System (OS) – Fall 2022: Midterm Exam**

**Instructor: Dr. Shayan (Sean) Taheri**

**Note – Cheating and Plagiarism**: Cheating and plagiarism are not permitted in any form and cause certain penalties. The instructor reserves the right to fail culprits.

**Deliverable**: All your responses to the assignment questions should be included in a single compressed file to be uploaded in the Gannon University (GU) – Blackboard Learn environment.

**Question 1-A.** Specify the most common attacks on operating systems and the related contributing factors.

**Question 1-B.** Explain the insider attack and provide an example for it.

**Question 1-C.** Explain a compiler backdoor and solutions for it.

**Question 1-D.** Explain the similarities and the differences between "Trusted Systems" and "Secured Systems". Then, define "Trusted Operating System" accordingly with meaningful statements.

**Question 1-E.** Mention the responsibilities of kernel in operating systems.

**Question 1-F.** Specify the functionalities of "Trusted Computing Base" and explain how to evaluate its quality.

**Question 2-A.** Explain the services of operating systems with examples.

**Question 2-B.** Specify the meaning and the types of system calls.

**Question 2-C.** Explain the similarities and the differences between the task/application management, file management, and user management programs with provision of examples.

**Question 3-A.** Mention the two major open-source secure modules for Unix-based operating systems with provision of their features, advantages, and disadvantages. Explain their differences in Access Control.

**Question 3-B.** Explain what Index Node is and mention its usage in Unix-based operating systems.

**Question 4-A.** Explain the meanings of Cryptography and Cryptanalysis, and specify their applications.

**Question 4-B.** Mention the usages of Encryption and Authentication processes.