GUST | Computer Science Department

CSC 474 Network Security

(3 contact hours – 0 lab hour - 3 credits)

Syllabus

General Information

Instructor	
Office	
Phone / Email	
Class Time / Location	
Office Hours	
Teaching Assistant / email	

Course Description

Foundations of network security, emphasizing confidentiality, integrity, and availability (CIA). Topics include common threats (malware, phishing, DoS), security policies, access control, authentication, encryption, and key technologies such as firewalls, IDS/IPS, and VPNs. Additional topics cover securing wireless networks, network protocols, cloud security, and emerging trends in network defense.

Course Co/Prerequisites

- CSC 473

Course Category

Elective

Course Outcomes

At the completion of this course, students will be able to:

1. Identify the basics of cryptography: cryptographic hash functions, symmetric and public-key encryption [SO # 1].
2. Evaluate and develop authentication techniques and key establishment [SO # 2].
3. Analyze and assess buffer overflow attacks, Web security, Internet worms, viruses, and spyware, considering their ethical and security implications [SO # 1, #4].
4. Investigate spam, phishing, botnets, and DoS attacks with security and ethical considerations. [SO # 1, #4].
5. Evaluate TCP/IP, DNS security and Wireless security [SO # 2].
6. Develop Firewalls and intrusion detection systems [SO # 2].

Required Textbook

- Network Security Essentials For You: From Principles to Practice, by Alex Cipher (Author) , 2024, ISBN-13 : 979-8322669906

Supplementary Textbook

- Network Security: Private Communication in a Public World 3rd Edition, by Charlie Kaufman (Author), Radia Perlman (Author), Mike Speciner (Author), Ray Perlner (Author), Publisher : Addison-Wesley Professional; 3rd edition (August 31, 2022 , ISBN-13 : 978-0136643609

Tentative Schedule

Week no.	Topic	MATERIAL (CHAPTERS AND/OR OTHER MATERIAL)
1	Introduction to Networking The OSI Model TCP/IP security	Chapter 1
2, 3	Introduction to Cryptography	Chapter 2 ,3
4, 5	Key distribution Key agreement	Chapter 4
6	Authentication Authorization	Chapter 5
7	Mid Exam	
8, 9	SSL TLS Kerberos	Chapter 6
10	Wireless Security	Chapter 7
11	Internet worms, viruses, spyware	Chapter 9
12 , 13	Spam, phishing, botnets, denial of service, and DNS security	Chapeter 10
14, 15	Firewalls and intrusion detection systems	Chapter 12
Final Exam		

Grading Scheme

Grade Category	Weight
Assignments/Exercises	**20%**
Quizzes	**10%**
Project	**20%**
Midterm Exam	**20%**
Final exam	**30%**

Academic Honesty

All work presented and submitted in this class must be your own. Submitting work that is not yours is considered cheating and will be subject to the policies of academic honesty at GUST. This includes using text copied from the Internet or other sources, using work generated by AI tools such as ChatGPT, Google's Bard, Bing AI, etc., using materials prepared by a paid agency or individual, using unauthorized help from anyone other than GUST academic staff and approved tutors, or even re-using your own work from other classes and assignments. Remember, anything more than five consecutive words written by someone else can be considered plagiarism and must put in “quotes”, cited in-text, and include an accompanying reference at the end of the paper, as per the course standards. Violating the policy of academic integrity will result in severe consequences, including failing grades, loss of university privileges, and even permanent dismissal.

Commit to Integrity

Academic Dishonesty Policy

1. Academic dishonesty includes such things as cheating, inventing false information or citations, plagiarism and helping someone else commit an act of academic dishonesty. It usually involves an attempt by a student to show possession of a level of knowledge or skill that he/she does not possess.
2. Cheating/plagiarism is absolutely forbidden. Any such misconduct may result in obtaining a zero on the assignment, failure in the course, and/or appropriate referral for disciplinary action.

Inclusion (OSC Accommodation)

I wish to fully include persons with disabilities in this course. Please let me know if you need any special accommodations in the curriculum, instruction, or assessments of this course to enable you to fully participate. I will maintain confidentiality of the information you share with me. If you have a disability that impacts your classroom performance and wish to request an accommodation, contact the One-Stop Student Services Center (OSC) at N3-101. The OSC

requires up-to-date documentation regarding your disability to enable them to comply with your request. Admission of OSC is voluntary and will be handled in a confidential manner. GUST does not discriminate against people with disabilities.