

Cybersecurity Concepts

Prepared by Dr. Diaa Salama

FNT625
Orientation Week

Lecture 0





مجموعة جامعة
الجميع الذكية
للتعليم القابضة

MIDOCEAN
UNIVERSITY

Cybersecurity Concepts

Lecture 0

FNT625
Orientation Week

Prepared by
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- Member, National Committee of Communications and Information Technology, Academy of Scientific Research & Technology, CAIRO, Egypt.
- Member, International Telecommunication Union (ITU), United Nations (UN)
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- Winner of the Arab Republic of Egypt Encouragement Award for Advanced Science and Technology in the Field of Engineering Sciences 2021
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- Winner of the DELL EMC AWARD for the academic year 2015/2016, 2016/2017, and 2017/2018



Dr.Diao Salama Ph.D

One of the top 2% Scientists worldwide 2023 by Stanford university ranking.

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Week

01

Course Basics data

Instructor:	Associate Professor : Diao Salama
Subject Name:	Cybersecurity Concepts
Subject Code:	FNT625
Program name:	Master of Financial Technology
University Name:	Midocean
Faculty	Faculty of Humanities
Department	Financial Technology
Academic Year	2024
Teaching Language	English
Date of establishment of the curriculum plan/Date of review of the curriculum plan.	2024

Week

01

Course Aims & Objectives

- Give the students a basic understanding of Cyber security issues
- Illustrate basic concepts about cryptography, network security protocols, and mechanisms to secure computers.

Week

01

Course Information

Communication:

- During Discussion panels
- SIS tickets

Course technology:

- New infrastructure
- Help us make it awesome!

Week

01

Course Information

- English/Arabic
- 80-90-minute videos
- Practice Questions by the end of each domain
- Extra study resources (if needed)

YOU MUST KNOW THE BASICS FIRST

Week

01

Prerequisites

Prerequisites:

- **No** specific prerequisites
- **No** work experience in cybersecurity.
- **Only**
 - ✓ Basic information technology (IT) knowledge & Network basics) & Math courses.
 - ✓ Basic English understanding

Week

01

This could be achieved through the following:

- Class Lectures
- Tutorials
 - Quizzes.
 - In-Class activities and attendance.
 - Final examination.
- Problem Solving



Week

01

Course Information

Work and Grading:

~ 10 Quizzes and Weekly Exam

~9 homework assignments:

Part 1: interactive, solve together

Part 2: written, solve together, write up alone, electronic submission through Moodle

Fixed scale

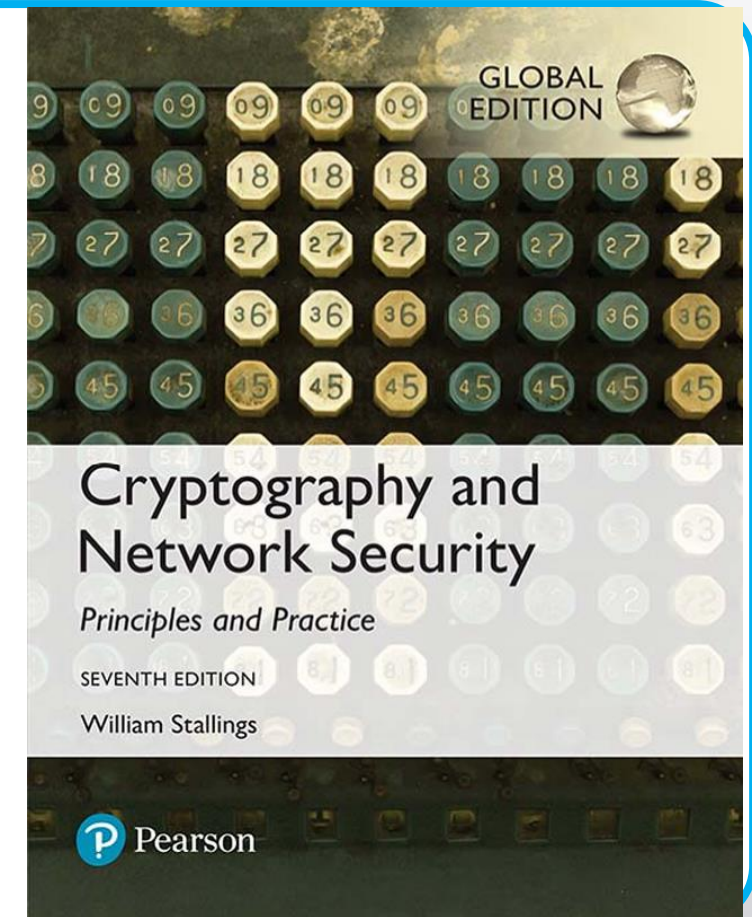
Contests!

Week

01

Text Book

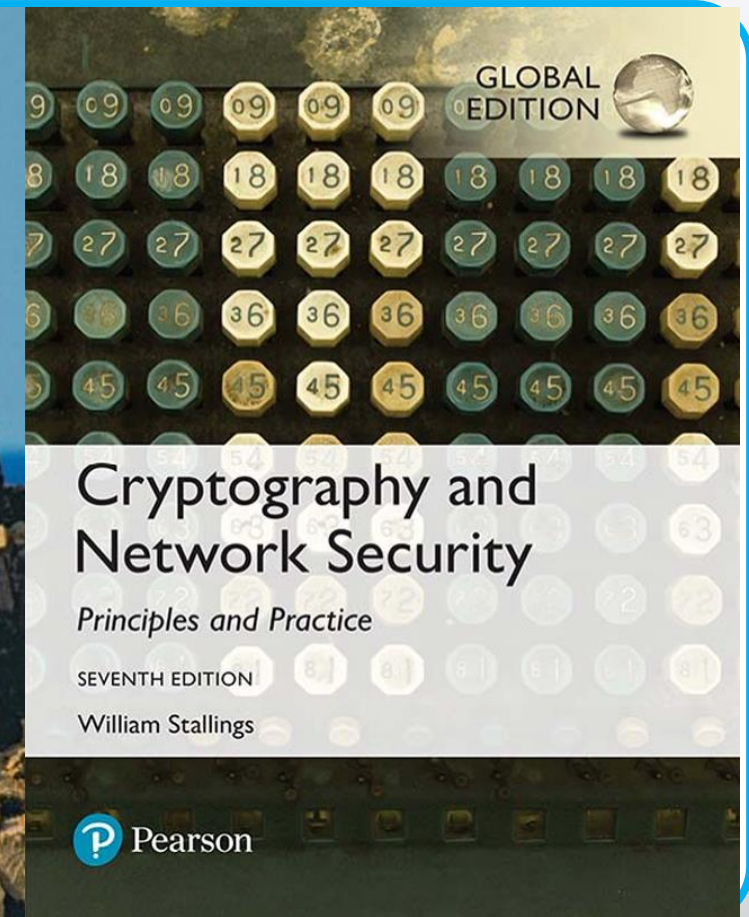
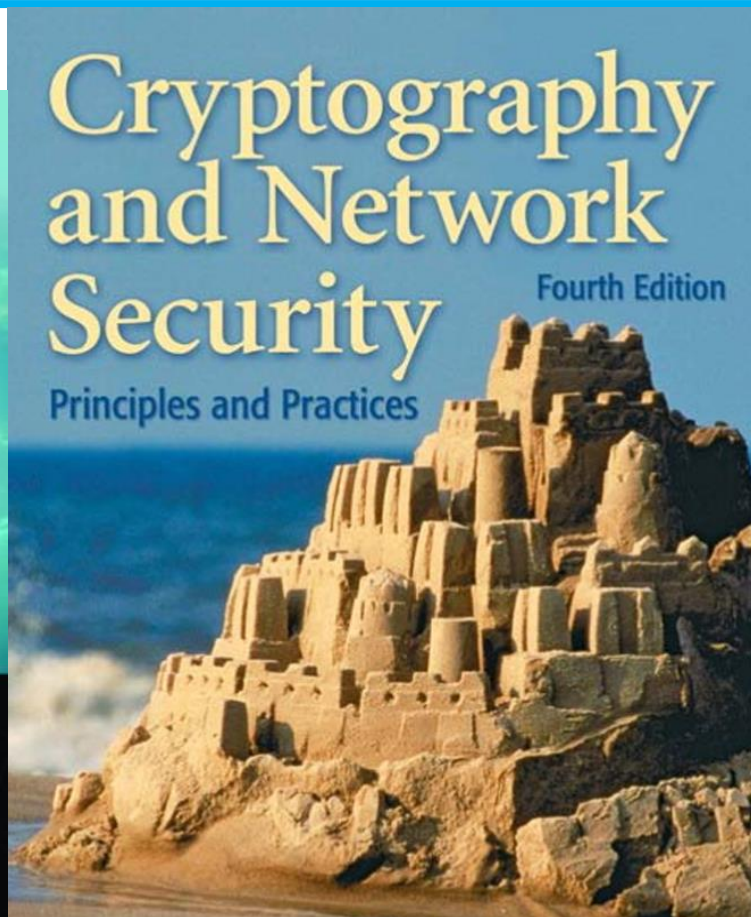
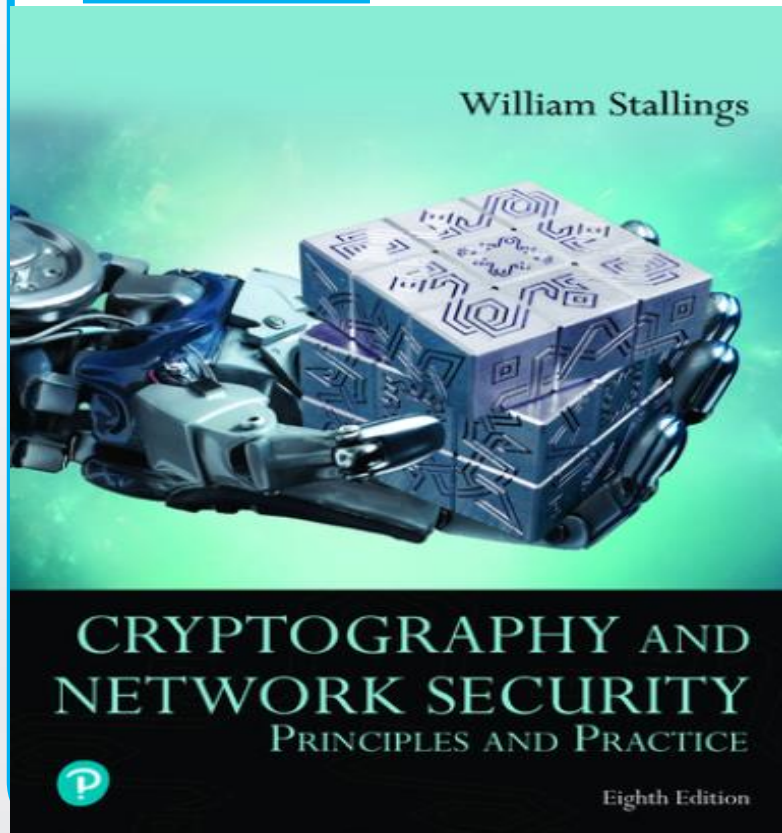
- Not required, but for students who want to read more we recommend
 - Russell & Norvig, AI: A Modern Approach, 3rd Ed.
 - Warning: Not a course textbook, so our presentation does not necessarily follow the presentation in the book.



Week

01

Textbook



Week

01

Course content and Weekly plan

Lecture	Topic	Date	Notes
1	Introduction		Lecture & Exam
2	Introduction to Network and Network Security		Lecture & Exam
3	Introduction to Security		Lecture & Exam
4	Classical Encryption Techniques		Lecture & Exam
5	Block Cipher and DES(Feistel Cipher)		Lecture & Exam
6	Block Cipher and DES(Attacks on DES)		Lecture & Exam
7	Finite Fields(Fields and Modular Arithmetic)		Lecture & Exam
8	Advanced Encryption Standard (AES)		Lecture & Exam
9	Public Key Cryptography RSA		Lecture & Exam
10	Message Authentication and Hashing		Lecture & Exam
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11	Introduction to Cloud Computing		Lecture & Exam
12	Revision		
13	Final Exams		
14	Final Exams		
	Final Exams		

Week

01

This Course Good For

- IT Professionals
- Career-changers
- College students or recent graduates
- Advanced high school students or recent graduates
- People interested in Cybersecurity

Week

01

Exam Overview

- 10 Weekly Exams MCQs / each Exam 8 Questions
- 24 Minutes
- Exam Availability: English
- Final Exam MCQs / 20 Questions

Chapter

01

Lets Start our Course



Basics Terminology



What is Networking!

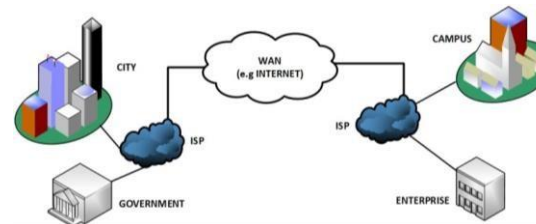
A network is simply two or more computers linked together to share data, information or resources.

Types of Networks

Local Area Network (LAN)



Wide Area Network (WAN)



Week

01

Network Devices

Hub
(Layer 1)

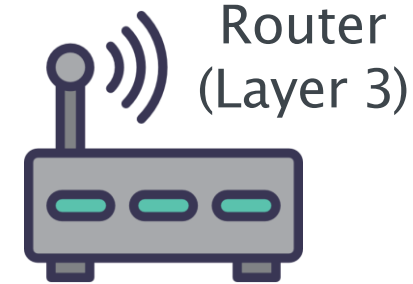


A wired devices that connects multiple devices in a network. Hubs are wired devices and are not as smart as switches or routers.

Switch
(Layer 2/3)



An intelligent hub that know the addresses of the devices connected to them. Switches are wired devices that are smarter than hubs, but not as smart as routers



Router
(Layer 3)

Used to control traffic flow on networks and are used to connect similar networks and control traffic flow between them. Routers can be wired or wireless. Routers determine the most efficient “route”

Week

01

Network Devices

Firewall (Layer 3/4/7)



A network device used to filter traffic that is typically deployed between a private network and the internet. Firewalls filter traffic based on a defined set of rules, also called filters or access control lists

Server



A computer that provides information to other computers on a network. Some common servers are web servers, email servers, database servers and file servers.

Endpoint



Endpoints are the ends of a network communication link. An endpoint can be another server, desktop workstation, laptop, tablet, mobile phone or any other end user device.

● Media Access Control (MAC) Address

A unique identifier assigned to a network interface controller for use as a network address in communications within a network segment. No two devices can have the same MAC address in the same local network; otherwise, an address conflict occurs. Example: 00-13-02-1F-58-F5

The first 3 bytes (24 bits) of the address denote the vendor

● Internet Protocol (IP) Address A unique string of characters that identifies each computer using the Internet Protocol to communicate over a network.

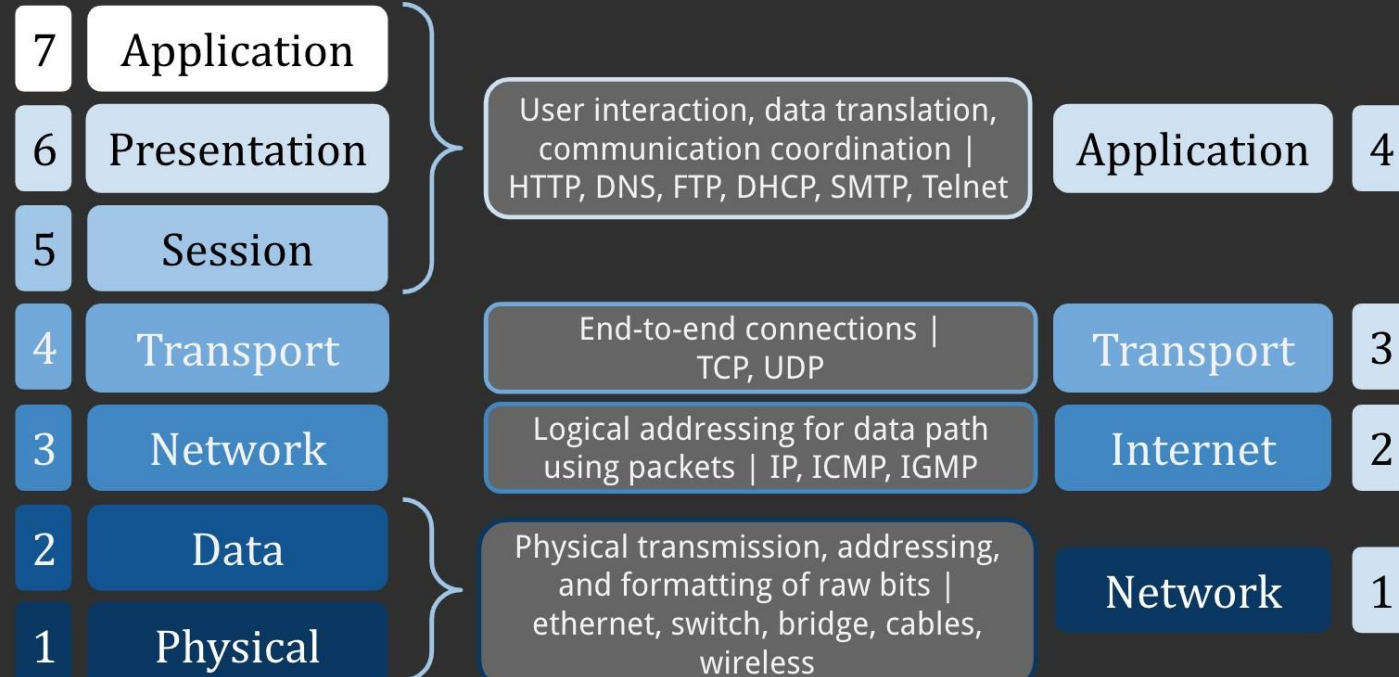
An IP address is a string of numbers separated by periods (.) or colons (:)

Versions of IP Address:

- IPV4 , ex: 192.168.1.1
- IPV6, ex: 1050:0:0:0:5:600:300c:326b

Network Layers Models **Next Lecture**

7-layer OSI Model vs. 4-layer TCP/IP Model



@varcharr



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Thank You

