Day 1 – Introduction to CN & Cybersecurity

1. What Is Computer Networking?

• Definition: Interconnecting devices to share data & resources.
• Key components: Hosts, switches, routers, links.
• Why it matters: Enables Internet, cloud services, IoT.

2. What Is Cybersecurity?

• Definition: Protecting systems/networks/data from digital attacks.
• CIA triad:
– Confidentiality: only authorized parties can read.
– Integrity: data isn't tampered with.
– Availability: services are up when needed.

3. OSI vs TCP/IP Models

Layer (OSI)	Function	TCP/IP Layer
7. Application	User-apps (HTTP, FTP…)	Application
6. Presentation	Data formatting, encryption	
5. Session	Sessions & dialogues	
4. Transport	End-to-end (TCP/UDP)	Transport (TCP/UDP)
3. Network	Routing (IP)	Internet (IP)
2. Data Link	MAC, switches	Link (Ethernet/Wi-Fi)
1. Physical	Cables, hubs, bits	

Note: TCP/IP collapsed Presentation & Session into Application.

Lab 1 – Exploring Basic Connectivity

Objectives:

1. Verify basic reachability with ping.
2. Map your network path with traceroute (Linux/macOS) or tracert (Windows).

Ping Test:

```
ping 8.8.8.8 -c 4
```

Traceroute:

```
traceroute google.com (Linux/macOS)
tracert google.com (Windows)
```

Save Your Output:

Redirect output to files for later review and commit.

Challenge – OSI Layer Mapping

Name the OSI layer(s) involved for each:
• 1. Fragmenting an IP packet
• 2. Establishing a TCP connection (3-way handshake)
• 3. Encrypting an HTTPS session
• 4. MAC address learning on a switch
• 5. Rendering a web page in your browser

Day 1 Resources

• OSI vs TCP/IP Explained – https://www.cloudflare.com/learning/ddos/glossary/open-systems-interconnection-model-osi/
• Ping & Traceroute Tutorial – https://www.computerhope.com/issues/ch001283.htm
• Intro to Cybersecurity (video) – https://www.youtube.com/watch?v=OtzGMsAy7Qo
• The CIA Triad article – https://www.varonis.com/blog/cia-triad/