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| PW-hardware & Networks (30h) |

## Course Objectives

This is an introductory course to computer networks that will provide students an understanding of the modern network technologies in common use today and to appreciate how computer networks are able to format and transfer data at high speed and over both the local and wide area. Students will learn what computer networks are and how they work, and will be able to demonstrate an understanding of the physical properties and performance characteristics of communication media; specifically copper cable, optical fibers and wireless networks. The emphasis will be on the design and implementation of computer networks.

**Topics to be covered include:**

1. Types of computer networks.
2. The main technologies used in computer networks.
3. Networking media.
4. Networking devices.
5. An overview of internetworking principles and how the Internet protocols, routing, and applications operate.
6. IP Address concepts.
7. Designing computer networks using packet tracer.

## Table of Content:

Chapter 1: Introduction To Networks (2H)

* 1. Introduction to computer networks.
  2. Types of Networks: LAN, WLAN, MAN, and WAN.

Chapter 2: NETWORKING Media (6H)

2.1- Networking cables:

* Twisted Pair cables: definition, characteristics, types (UTP / STP), connectors, advantages, disadvantages.
* TP LAB: Preparing a cross over cable and a straight through cable.
* Coaxial cables: definition, characteristics, types (Thin / Thick), connectors, advantages, disadvantages.
* Optical fibers: definition, characteristics, connectors, advantages, disadvantages.

2.2- Wi-Fi technology:

* Definition, characteristics, standards and security.
* TP LAB: Configuring a Wi-Fi network using a wireless router and a laptop.

Chapter 3 : Networking devices (6H)

* The Network Interface Card (NIC).
* The Repeater.
* The Hub.
* The Switch.
* The bridge.
* The Router.
* TP LAB: Configuring a HUB/Switch network.

Chapter 4: Networking Protocols (10H)

4.1- OSI Model vs TCP/IP Model.

4.2- IP Address:

* Role.
* IP Classes.
* The Subnet Mask.
* DHCP Role.
* Subnetting Basics.

4.3- TP LAB :

* Installing a LAN using a switch and UTP cabling.
* IP Address configuration.
* Network testing (ipconfig, ipconfig/all, loopback test,….).

Chapter 5 : Packet Tracer LABS (6H)

1. Basic Router configuration.
2. Static Routing configuration.
3. Default Route configuration.
4. Dynamic Routing (RIP configuration).

## Bibliographie

* Computer Networks and Intemets / Douglas E. Corner / Second Edition.
* Introduction to Networks / CISCO
* Cisco Certified Network Associate Study Guide (640-802)