Helwan National University (HNU)
Course Code: COM204
Course Name: Computer Networks
Instructor: Prof. Mahmoud Elmesalawy
Teaching Assistant: Eng.Adham Ehab
Academic Year: 2024/2025

COM204 Course Project

Project Title

Designing a Computer Network for Helwan National University (HNU)

Project Objective

The objective of this project is to design and configure a functional and efficient network for Helwan National University. The university consists of multiple faculties, each housed in a separate building. The network must support reliable communication between faculties, ensure efficient resource allocation, and provide secure remote access for management and troubleshooting.

Scenario

Helwan National University has recently expanded its campus and aims to modernize its IT infrastructure by implementing a robust network design connecting all buildings together. Each building represents one or more faculty with a total number of 9 Faculties in addition to the administration building (Faculty of Engineering - Faculty of Computer Science and Information Technology - Faculty of Arts and Applied Arts - Faculty of Dentistry - Faculty of Physical Therapy - Faculty of Science - Faculty of Humanities, Commerce and Business Administration - Faculty of Medicine - Faculty of Applied Health Sciences Technology). The university need to design a phase 1 project to connect only three buildings that contain the following faculties (Faculty of Engineering - Faculty of Computer Science and Information Technology - Faculty of Medicine) and the administration building together.

Each student is tasked with the following:

1. Designing a network topology to connect the required buildings together on the Packet Tracer Network Simulator.
2. Assigning subnets to each building while minimizing IP waste.
3. Configuring routers, switches, and other used devices for optimal network performance.
4. Implementing secure remote access and dynamic routing.

Key Features of the Designed Network

1. **Subnetting:** Efficiently divide the given IP block for each faculty.
2. **Switch Configuration:** Set up management IPs, VLANs for internal segmentation, secure console access, and change the switch's hostname.

3. **Routing:** Enable communication between faculties using a mix of static and dynamic routing protocols like RIP and OSPF.
4. **DHCP:** Automatically assign IP addresses to faculty devices while ensuring address availability and control.
5. **Telnet Access:** Provide secure remote management of switches and routers from an administrative workstation.
6. **VLANs:** Organize departments within faculties (e.g., IT, HR, Student Affairs) into logical networks for improved traffic management.

Configuration Notes:

- Each student must rename the router's hostname **by his/her name – Faculty name**
- Each student must assign to the telnet IP in the host part the last **3 digits of his/her ID.**

Grading Criteria:

- **Correctness (50%):** Accurate network configuration, including subnetting, routing, and switch settings.
- **Documentation (20%):** Step-by-step documentation with screenshots.
- **Uniqueness (30%):** Ensure no two projects share identical IP schemes, VLAN IDs, or routing setups.
- Each student should work individually to achieve the project.

Submission:

- Each student is asked to submit the following files through the mentioned submission link before the specified deadline
    1. Packet tracer file for the designed network topology.
    2. Your project documentation.
- **Submission Deadline:** 20th December 2024 @ 11:59PM
- **Submission Link:** https://forms.gle/4ugA6STpsPaXyLNZ7

  (*Will be available one week before submission deadline)*

Good Luck