

## **Project Title: Introduction to Networking with Cisco Packet Tracer**

**Project Objective:** The objective of this project is to introduce the student to networking concepts and Cisco Packet Tracer, a simulation tool for network configuration and troubleshooting. By completing this project, the student will gain hands-on experience with designing, configuring, and testing basic network setups.

### **Project Steps:**

#### **Introduction to Cisco Packet Tracer:**

- Provide an overview of Cisco Packet Tracer and its capabilities.
- Explain the importance of networking in modern IT environments.
- Install Cisco Packet Tracer on the student's computer or use the online version.

#### **Basic Network Design:**

- Discuss the components of a network: routers, switches, PCs, servers, etc.
- Design a simple network topology using Packet Tracer's drag-and-drop interface.
- Include at least one router, one switch, and multiple PCs in the network.

#### **Device Configuration:**

- Configure basic settings for each device in the network.
- Set IP addresses, subnet masks, and default gateways for PCs.
- Configure IP addresses on router interfaces.
- Assign hostnames to devices for easier identification.

#### **Inter-VLAN Routing:**

- Introduce the concept of VLANs (Virtual Local Area Networks) and their benefits.
- Configure VLANs on the switch and assign ports to respective VLANs.
- Configure router-on-a-stick inter-VLAN routing.
- Test connectivity between devices on different VLANs.

#### **Static Routing:**

- Explain the difference between static and dynamic routing.
- Configure static routes on the router to enable communication between different networks.
- Test connectivity between PCs in different networks.

#### **DHCP Configuration:**

- Introduce DHCP (Dynamic Host Configuration Protocol) and its role in network configuration.
- Configure the router or a server to act as a DHCP server.
- Define DHCP scopes and lease durations.
- Verify DHCP lease assignments on client PCs.

#### **Network Troubleshooting:**

- Introduce common network troubleshooting techniques.
- Simulate network issues such as connectivity problems or misconfigurations.

- Use Packet Tracer's simulation mode to identify and resolve issues.
- Document troubleshooting steps and solutions for future reference.