



### **Course Description**

#### **TCN0310 | Network Cabling and Installation | 3.83 credits**

This course provides a comprehensive overview of network cabling and installation techniques essential for building robust telecommunications infrastructures. Students will explore various types of cabling, including twisted pair, coaxial, and fiber optic, while gaining hands-on experience in installation practices, cable termination, and testing procedures.

### **Course Competencies:**

**Competency 1:** The student will learn to understand and apply network topologies and architectures by:

1. Designing network diagrams that illustrate various topologies such as bus, star, ring, and mesh
2. Comparing the advantages and disadvantages of different network architectures for specific business scenarios
3. Implementing small-scale networks using appropriate topologies based on given requirements
4. Analyzing existing network structures to recommend improvements in topology or architecture

**Competency 2:** The student will learn to implement network cabling and connectivity solutions by:

1. Selecting appropriate cable types and connectors for different network installations
2. Installing and terminating various types of network cables according to industry standards
3. Testing cable installations using specialized tools to ensure proper connectivity and performance
4. Troubleshooting connectivity issues related to cabling and physical layer problems

**Competency 3:** The student will learn to configure and manage network devices by:

1. Configuring routers and switches with basic settings for network functionality
2. Implementing VLANs and inter-VLAN routing to segment network traffic effectively
3. Managing network devices remotely using protocols such as SSH and SNMP
4. Updating and maintaining firmware on network devices to ensure security and performance

**Competency 4:** The student will learn to apply network protocols and services by:

1. Configuring DHCP servers to automatically assign IP addresses to network clients
2. Implementing DNS services to resolve hostnames to IP addresses within a network
3. Setting up network time synchronization using NTP across multiple devices
4. Applying routing protocols such as OSPF or BGP to enable efficient network communication

**Competency 5:** The student will learn to implement network security principles by:

1. Configuring firewalls to control incoming and outgoing network traffic based on security policies
2. Implementing access control lists (ACLs) to restrict network access based on IP addresses and ports
3. Setting up virtual private networks (VPNs) to secure remote access to network resources
4. Monitoring network traffic for potential security threats using intrusion detection systems

**Competency 6:** The student will learn to troubleshoot common network issues by:

1. Diagnosing connectivity problems using command-line tools such as ping, traceroute, and NS Lookup
2. Analyzing network logs to identify and resolve performance issues or security incidents
3. Implementing network monitoring solutions to proactively detect and address potential problems
4. Developing and following systematic troubleshooting procedures to efficiently resolve network issues

### **Learning Outcomes:**

- Solve problems using critical and creative thinking and scientific reasoning
- Formulate strategies to locate, evaluate, and apply information