# NOVA COLLEGE-WIDE COURSE CONTENT SUMMARY
# ITN 157 – WAN TECHNOLOGIES - CISCO (4 CR.)

## Course Description

Concentrates on an introduction to Wide Area Networking (WANs). Includes WAN design, LAPB, Frame Relay, ISDN, HDLC, and PPP. Lecture 4hours per week.

## General Course Purpose

The course aims to prepare for Cisco certification exam. Extensive lab activities will reinforce router and switch configuration learned from previous modules and students will receive guidance and support to prepare for the Cisco certification exam. This course also includes more in depth coverage of key routing protocols and covers selected topics in IP Services and Network Assurance.

## Course Prerequisites/Corequisites

Prerequisite: CCNA level of skills (ITN 156), or permission of instructor. College Level reading and writing ability.

## Course Objectives

Upon completing the course, the student will be able to sit for the CISCO certification and will further enhance their knowledge specifically in the areas of:

- Describe Packet Forwarding and Cisco Express Forwarding
- Compare hardware and software switching mechanisms
- Describe algorithms used by different routing protocols to forward packets.
- Configure EIGRP, Single and Multiple Area OSPF
- Describe basic BGP features and Configure eBGP branch connection
- Configure IP Services for redundancy and synchronization
- Configure VPN Tunnels to secure site to site and remote access connectivity
- Troubleshoot an enterprise network using common tools and techniques.

## Major Topics to be Included

- Packet Forwarding and CEF
- EIGRP
- Single and Multiple Area OSPF
- BGP
- Network Assurance
- IP Addressing Services
- Other topics can be cited

## Student Learning Outcomes

**Dynamic Routing**

Explain the features and characteristics of dynamic routing protocol
Explain how distance vector routing protocols operate
Explain how link-state protocols operate

**EIGRP**

Explain the features and characteristics of EIGRP.
Implement EIGRP for IPv4 in a small to medium-sized business network

Explain how EIGRP operates in a small to medium-sized business network.
Implement EIGRP for IPv6 in a small to medium-sized business network.

**EIGRP Tuning and Troubleshooting**

Configure EIGRP to improve network performance.
Troubleshoot common EIGRP configuration issues in a small to medium-sized business network

**Single-Area OSPF**

Explain how single-area OSPF operates.
Implement single-area OSPFv2.
Implement single-area OSPFv3.

**Multiarea OSPF**

Explain how multiarea OSPF operates in a small to medium sized business network.
Implement multiarea OSPFv2 and OSPFv3.

**OSPF Tuning and Troubleshooting**

Advanced Single-Area OSPF Configurations
Configure OSPF to improve network performance.
Troubleshoot common OSPF configuration issues in a small to medium-sized business network.

**Border Gateway Protocol**

BGP Fundamentals
Implement eBGP in a single-homed remote access network.

**Network Monitoring and Security**

IP Services
- NAT Review
- DHCP Review
- NTP

SNMP and SPAN
- Configure SNMP to monitor network operations
- Troubleshoot a network problem using SPAN.

Access control lists
- Configure extended IPv4 ACLs.
- Configure IPv6 ACLs.
- Troubleshoot ACLs

**VPN**

Explain how VPNs secure site-to-site and remote access connectivity

**GRE**

Implement a GRE tunnel.

**Required Time Allocation per Topic**

In order to standardize the core topics of ITN 157, the following student contact hours per topic are required. Each syllabus should be created to adhere as closely as possible to these allocations. Of course, the topics cannot be followed sequentially. Many topics are taught best if it reflects the current android version. There are normally 60 student contact-hours per semester for a four credit course. (This includes 15 weeks of instruction and does not include the final exam week so 15* 4 = 60 hours. Sections of the course that are given in alternative formats from the standard 16 week section still meet for the same number of contact hours.) The final exam time is not included in the time table. The changes in Android Development are happening so fast that some of the content easily could be less significant soon. So it is really important to include the changes in syllabus. Also, additional topic/ Optional Content, leaves ample time for an instructor to tailor the course to special needs or resources.

| Topic | Time in Hours | Percentages |
|---|---|---|
| Packet Forwarding, CEF | 3 | 5 |
| EIGRP | 15 | 25% |
| OSPF | 15 | 25% |
| Network Assurance | 9 | 15% |
| BGP | 6 | 10% |
| IP Addressing services | 12 | 20% |
| **Total** | 60 | 100% |