

Course Outline

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Course Title:	T9101-Understanding IP
Course Duration:	3 Days Classroom without labs
	5 Days Classroom with hands on labs
	3 Days Webinar

Section 1

Welcome, Introductions, House rules, course agenda.

Section 2

Origins and development of IP.

- What IP was designed to do
- Strengths and weaknesses of IP
- IP and the OSI 7 Layer Model
- Operational concepts of IP
- The Internet Vs. intranets/extranets/COINs
- IP standards and RFC's
- Who are RIPE, IETF, IEEE, IAB, Etc.

Section 3

IP Addressing:

- The 4 Byte limitation
- Dotted decimal denotation
- Networks, sub-networks, interfaces, and hosts
- Recap on Binary notation
- The subnet mask
- Manipulating the subnet mask
- Classful Vs. Classless addressing
- Reserved, broadcast, and forbidden addresses
- Private versus public addresses

Section 4

IP Operation

- Understanding and decoding the IP header
- Principles of fragmentation
- Principles of IP packet routing
- The IP routing table (static)

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- Use of ping and traceroute
- ARP/RARP

LAB 1 Building, Testing and monitoring a simple IP LAN with Microsoft

- Essential Cisco

LAB 1 Adding and testing routers and static routes

Section 5

Dynamic IP addressing:

- The bootp and DHCP protocols
- The DHCP server
- Operation of DHCP
- DHCP over the backbone network

LAB DHCP Operation

Section 6

Numbers Vs. Words

- The URL structure
- The concepts, principles, and terminology of the Domain Name Service, DNS
- The DNS protocol and its operation
- Different types of look up
- DNS caching
- Primary and secondary DNS
- Dynamic DNS

LAB Building, testing and monitoring a DNS system.

Section 7

IP routing protocols:

- Static Vs. Dynamic routing
- Routing protocols Distance Vector Vs. Link state
- The autonomous system
- Common Routing protocols in detail.
 - RIP2
 - OSPF
 - ISIS (Overview)
- Gateway Protocol principles
- BGP(4)
 - BGP concepts and principles
 - BGP protocol structure
 - BGP operation

LAB Testing an interior routing protocol (OSPF)
LAB Configuring and testing BGP

Section 8

Above Layer 3

- Ports, sockets, well known and ephemeral ports
 - Telnet
 - HTTP
 - FTP
 - TFTP
- TCP and UDP Operation
- Network Address Translation Service, NATS.
 - Concepts of inside, outside, local, and global addresses
 - Simple NATS for client initiated transactions
 - Problems of host initiated transactions with NATS
 - Bidirectional NATS
 - Static Vs. Dynamic NATS
 - Impact of NATS on:
 - IPsec
 - Protocols such as FTP
 - Oversubscription of inside global addresses
 - NATP and PAT
 - NAT Editors

LAB Setting up/trouble shooting NAT
LAB Setting up bi directional NAT

Section 9

IP Security Introduction

- PPP
- Dial in IP security
 - PAP
 - CHAP
 - RADIUS
- PPTP
- L2TP operation

LAB Monitoring PPP

LAB Building and monitoring L2TP

- Firewall principles
- Common ways of attacking an IP network
- How to protect networks
- IP Filtering
- IP Sec

Final exam and assessed lab

Course wrap up

