

Networking

Addressing, switching, routing and troubleshooting. You subnet a network by hand, build a campus in simulation, and diagnose faults by reading what the wire is telling you.

Foundational

5 phases

23 sessions

35 contact hours

Syllabus

5 phases, 23 sessions. Each phase ends in something you have built.

1

Read the Wire

Watch real traffic and learn which layer a problem lives on before touching a device.

4 sessions

\$58 alone

1.1 How a Message Actually Travels

Encapsulation, the TCP/IP model, and mapping OSI layers onto something you can point at.

[FREE PREVIEW](#)

1.2 Ethernet, MAC, and ARP

Frames, switch MAC learning, broadcast domains, and what ARP is really asking.

1.3 IP, TCP, UDP, and Ports

Addresses versus ports, the three-way handshake, and why UDP is not broken.

1.4 Wireshark on Your Own Traffic

Capture filters, following a stream, and watching DHCP, DNS, and TCP set up a single page load.

By the end: **A packet capture of one page load, annotated frame by frame from DHCP request to first HTTP response.**

2

The Addressing Wall

Do subnet math reliably, in binary, without a calculator and without a lookup chart.

5 sessions

\$58 alone

2.1 Binary, Bit by Bit

Powers of two, dotted decimal to binary and back, and reading a mask as a boundary.

2.2 Subnetting Without a Chart

Splitting a block, network and broadcast addresses, usable host ranges, and drills every session from here on.

2.3 VLSM and Summarization

Sizing each subnet to its actual host count, then summarizing the result back up into one route.

2.4 IPv6 Addressing

Hex, the /64 convention, link-local versus global unicast, SLAAC, and running dual stack alongside IPv4.

2.5 The Same Plan in a Cloud VPC

Applying your CIDR plan to an AWS VPC: subnets, route tables, and security groups on the same math.

By the end: **A VLSM addressing plan for a four-site organization, IPv4 and IPv6, written on paper and then built once as a cloud VPC.**

3

Build the Campus

Configure a switched network on Cisco gear and predict what it will do before you press enter.

5 sessions

\$58 alone

3.1 Living in Cisco IOS

Modes, show commands, SSH access, and saving a config so a reload does not erase your evening.

3.2 VLANs and Trunks

Access ports, 802.1Q tags, the native VLAN, and segmenting a campus that still needs to talk.

3.3 Inter-VLAN Routing

Router-on-a-stick versus switched virtual interfaces, and choosing one on purpose.

3.4 Redundancy That Holds

STP and RSTP root election, PortFast, BPDU guard, root guard, and EtherChannel bundles.

3.5 Wireless and PoE

Controller-based WLAN architecture, SSIDs, WPA3, and powering access points over the same cable.

By the end: **A multi-VLAN campus LAN, wired and wireless, with every device config committed to Git.**

4

Route, Serve, and Defend

5 sessions

Connect the sites, hand out addresses, reach the internet, and refuse the traffic that should not pass.

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4.1 Static Routing and the Routing Table

Next hops, longest-prefix match, default routes, and reading a routing table out loud.

4.2 OSPFv2, Single Area

Neighbors, adjacency, cost, and watching a network reconverge after you unplug a link.

4.3 IP Services: DHCP, NAT, NTP, Syslog

Address pools, translating private to public, and timestamps that make two logs comparable.

4.4 First-Hop Redundancy and Dual Stack

HSRP, a default gateway that survives a dead router, and routing IPv6 next to IPv4.

4.5 Access Control and Port Security

Standard and extended ACLs, where to place them, port security, and a hardened default config.

By the end: **A routed multi-site internetwork running single-area OSPF with DHCP, NAT, and ACLs, tested against a written spec.**

5

Break It, Then Automate It

4 sessions

Diagnose a network you did not build, then stop fixing the same thing by hand.

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5.1 A Method, Not a Guess

Symptom to layer to hypothesis to test, and the show commands that settle each question.

5.2 Broken Network Clinic

Working labs sabotaged one fault at a time, on the clock, writing down what you ruled out and why.

5.3 Devices Have APIs

JSON, REST calls against a controller, and a first Python script that pulls config off a switch with Netmiko.

5.4 Ansible, and AI in the NOC

Playbooks instead of copy-paste, config as reviewable text, and where an AI assistant helps or quietly lies.

By the end: **A triage logbook covering eight injected faults, plus an Ansible playbook that builds the lab from an empty config.**

Tools you will use

Cisco Packet Tracer

Cisco IOS CLI

Cisco Modeling Labs (CML-Free)

Wireshark

Cisco NetAcad

Python + Netmiko

Ansible

AWS VPC

What you will build

1 The Addressing Plan

Four sites, one block, IPv4 and IPv6

2 Campus Build-Out

VLANs, wireless, and OSPF against a written spec

3 Eight Faults

Diagnose a network you did not build

Registration

Phase 1: Read the Wire	\$58
Phase 2: The Addressing Wall	\$58
Phase 3: Build the Campus	\$58
Phase 4: Route, Serve, and Defend	\$58
Phase 5: Break It, Then Automate It	\$58

Whole track, all 5 phases

\$240

Buying every phase separately costs \$290, so the whole track saves \$50.

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