
Telecom, Datacom and Networking DVD Video Training Courses for Non-Engineers

Private lessons from the Director of the Institute... at your own pace!

Teracom's self-paced DVD-video courses: ideal for learning about telecom, datacom, networking, IP, MPLS, Voice over IP and wireless outside of structured seminars.

Teracom DVD-video training courses are **multimedia**: an engaging, knowledgeable and humorous on-camera instructor, extensive graphics, point-by-point onscreen bullets and extensive notes.

These dual-purpose DVD courses can be displayed on a television or LCD projector for **group training, or played in a PC for individual self-paced training**. Navigation menus allow you to jump directly to topics, so you can watch one segment at a time - or watch start to finish like instructor-led training.

Every course comes with a **comprehensive course book** with copies of all graphics and detailed reference notes, **sure to be a valuable reference** for years to come. The course book that accompanies the video is the corresponding part of the same course book used in our public seminars.

Certification is included. Each course has an online knowledge evaluation test. Successful completion of the test results in certification of the student, who receives a certificate suitable for framing.

These high-quality multimedia DVD courses will give you with the insight and understanding of the key concept-level knowledge, jargon, buzzwords and technologies that is our trademark... as close as you can get to a private lesson without actually being there.

Core Training: Telecom, Datacom, Networking, IP, MPLS and much more

Based on our most popular instructor-led Course 101, *Telecom, Datacom and Networking for Non-Engineers*, the set of five "core training" DVD-video courses V1 - V5 puts a structured understanding of telecommunications and IP networking in place, establishing a solid base of fundamentals, explaining the buzzwords, jargon and mainstream technologies... and how it all fits together – in plain English.

These courses have been totally updated - covering the fundamentals and including explanation of MPLS and other new technologies.

Wireless: Fundamentals, Cellular to 4G LTE, WiFi and more

V6 "Understanding Wireless" is a complete course beginning with radio and spectrum fundamentals, then a comprehensive overview and update on mobile communications: cellular principles, digital voice, data over cellular, mobile Internet access, the technologies: FDMA, TDMA, CDMA and OFDM, and the generations: 2G GSM, 3G 1X, UMTS and HSPA and 4G LTE, and finishing with fixed wireless: Bluetooth, WiFi, WiFi security, WiMAX, satellite and more.

Understanding Voice over IP

Based on our very popular instructor-led Course 130 *Understanding Voice over IP*, V8, V9 and V10 are a set of three DVD video courses that explain Voice over IP (VoIP) from top to bottom and front to back - designed for those who need to get up to speed, understand what VoIP is all about, separate hype from reality, understand the buzzwords and jargon, sort out the protocols, standards, architectures and understand mainstream solutions.

These courses have been totally updated, covering SIP, MPLS, Hosted PBX solutions and much more.

Hundreds of organizations have purchased Teracom video training courses!

Order today to make this invaluable addition to your telecommunications training library.

Order online at www.teracomtraining.com or call us toll-free: 1-877-412-2700

High-Level Overview

Detailed descriptions are on following pages

Core Training

Based on our most popular course, *Telecom, Datacom and Networking for Non-Engineers*, this set of five video courses will put a structured understanding of telecommunications and IP networking in place, establishing a solid base of fundamentals, explaining the buzzwords, jargon and mainstream technologies ... and how it all fits together, in plain English.

V1 Fundamentals of Telecom 1

Length 142 minutes. DVD-R NTSC format. 55-page 8.5" x 11" softcover bound course book.
The PSTN • Telephony • Telecom Equipment • The Telecom Industry

V2 Fundamentals of Telecom 2

Length 124 minutes. DVD-R NTSC format. 63-page 8.5" x 11" softcover bound course book.
Voice Digitization • DS0-DS3 • Digital Transmission and TDM • T1 • T3 • ISDN • SONET • Fiber • DWDM

V3 Fundamentals of Datacom and Networking

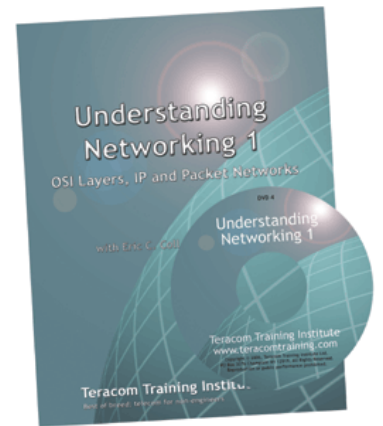
Length 106 minutes. DVD-R NTSC format. 65-page 8.5" x 11" softcover bound course book.
WANs and LANs • MAC Frames vs. IP Packets • The Network "Cloud"

V4 Understanding Networking 1

Length 127 minutes. DVD-R NTSC format. 58-page 8.5" x 11" softcover bound course book.
OSI Layers • Protocol Stacks • The FedEx Analogy
IP Addressing, DHCP, NAT • Bandwidth on Demand Services • Frame Relay • ATM • MPLS

V5 Understanding Networking 2

Length 151 minutes. DVD-R NTSC format. 64-page 8.5" x 11" softcover bound course book.
The Internet • ISPs • The Web • IP Security • Viruses • Firewalls • Encryption • IPsec • VPNs



Wireless

Understanding Wireless is a complete course covering fundamentals, mobile and fixed wireless. Part 1 begins the course with fundamentals. Part 2 provides comprehensive coverage of mobile communications: cellular principles, digital voice, data over cellular, mobile Internet access, the technologies: FDMA, TDMA, CDMA and OFDM, and the generations: 2G GSM, 3G 1X, UMTS and HSPA and 4G LTE. Part 3 rounds out your knowledge with fixed wireless: lessons on Bluetooth, WiFi, WiFi security, WiMAX, satellite and more.

V6 Understanding Wireless

Length 185 minutes. (More than 3 hours long!) DVD NTSC format. 74-page 8.5" x 11" softcover bound course book.
Radio Fundamentals • Spectrum • Mobility • Cellular Principles • Digital Voice • Mobile Internet
Technologies: TDMA, CDMA, OFDM • Generations: 2G GSM, 3G 1X, UMTS and HSPA, 4G LTE
Fixed wireless: Bluetooth, WiFi, WiFi security & encryption, WiMAX, satellite and more

Voice over IP

Based on our very popular instructor-led Course 130 Voice over IP, V8, V9 and V10 are a set of three DVD video courses that explain Voice over IP from top to bottom and front to back. These courses are designed for those who need to get up to speed, understand what VoIP is all about, separate hype from reality, understand the buzzwords and jargon, sort out the protocols, standards, architectures and understand mainstream solutions.

V8 Understanding Voice over IP 1

Length 134 min. DVD-R NTSC format. 60-page 8.5" x 11" softcover bound course book.
Components • Standards • Architectures

V9 Understanding Voice over IP 2

Length approx 119 min. DVD-R NTSC format. 48-page 8.5" x 11" softcover bound course book.
Voice Packetization • Voice Quality • Codecs, Jitter, Packet Loss • Diff-Serv • Network QoS with MPLS

V10 Understanding Voice over IP 3

Length approx 116 min. DVD-R NTSC format. 54-page 8.5" x 11" softcover bound course book.
SIP and IP Call Flow • Carrier Interconnect • Megaco

Try Before You Buy! Visit teracomtraining.com/video-previews.htm

The DVD Advantage

Cinema-quality video, animated bullets, plenty of crisp graphics, navigation menus and more - plus DVDs are convenient and easy to pass around in your department. DVDs also mean guaranteed to play in your laptop, ideal to watch with headphones on plane flights.

DVDs also play in DVD players - connect to your LCD projector and you've got a very high value-added scenario for your organization. We'll bundle books and certificates for everyone at a reasonable price.

Our engaging and often humorous on-screen instructor will keep you engaged and learning – the next best thing to private lessons from the Director of the Institute!

How to Purchase

- **Purchase online** using your credit card at www.teracomtraining.com
- **Order by mail, fax, check or Purchase Order** with the order form at the end of this brochure.
- **Call us toll-free** at 1-877-412-2700 or use the contact form on our website.

Pricing and Packages

Each course comes with an approx. 2-hour full-color multimedia DVD and a comprehensive course book/textbook with copies of all graphics and detailed reference notes sure to be a valuable reference for years to come. PLUS, a knowledge evaluation exercise and personalized course completion certificate signed by Eric C. Coll, M.Eng., P.Eng., Director of the Institute and suitable for framing.

We are offering some very special pricing packages:

- Core Training Package 1 (V1-V5) is US\$879 for the set of five courses on DVD with detailed course books.
- Add wireless for Core Training Package 2 (V1-V6) for US\$995 for six courses with detailed course books.
- The VoIP courses (V8-V10) are US\$695 for the set of three VoIP courses on DVD with course books.
- Other packages including the full library and individual courses are also available.

Compare this to \$500 for *one* short course elsewhere, and you'll agree that this is a very good deal. PLUS, our courses are up-to-date, authoritative, and packed with information. Add to this the high-quality course book/textbook for each course, the exercises and certificate suitable for framing...

Hundreds of organizations have purchased our video sets!

Order today to make this invaluable addition to your telecommunications training library.

Free Shipping

We'll ship your DVDs and student manuals to you for free by ground within the US 48 contiguous states and 10 Canadian provinces.

Your Course Materials: An Invaluable Reference

Every course comes complete with a high-quality comprehensive course book that's been called the best on-the-job reference tool around. Written in plain English, this easy-to-use reference includes copies of all graphics PLUS extensive detailed accompanying text.

Topics are organized in logical groups to give you easy reference after the seminar to the practical experience, theoretical background, and unbiased information on industry technologies, products and trends you'll need. With numerous chapters covering all major topics, you'll obtain an invaluable resource for years to come.

Certification is Included

Each course has an online knowledge evaluation test. Successful completion of the test results in certification of the student, who receives a certificate suitable for framing. The Full Library package includes and is a study guide for TCO CTA certification for up to five people.

Bonus! Online Courses

The Full Library package includes access to all current online courses for up to five people as a free bonus.

Six Reasons to Take a Teracom Course

Teracom's courses have been taught to wide acclaim across North America since 1992 and are designed for the **non-engineering professional** needing to fill in the gaps, build a solid base of knowledge... and see how it all fits together.

1. Cut through the buzzwords, jargon and vendor hype to gain the big picture view of communications and networking you can put to use today ... and into the future.
2. Build the career-enhancing knowledge tools you need to succeed in the fast-changing world of communications.
3. Build a structural understanding of telecommunications and networking, allowing you to make meaningful comparisons and informed decisions.
4. Understand mainstream solutions to today's requirements, and obtain templates you can put to immediate use.
5. Obtain detailed course books / textbooks that will serve as a valuable reference for years.
6. Understand how it all fits together.

Develop a structure for understanding technologies and solutions, allowing you to make informed choices and meaningful comparisons -- knowledge you can't get on the job, reading trade magazines or talking to vendors.

Here's What Our Customers Are Saying

Hundreds of people like you have benefited from Teracom's training. Many tell us their Teracom course was their best course ever; filled gaps in their knowledge and tied everything together... knowledge they've been needing for years. Here's a sampling of comments from Teracom alumni:

"Feedback from my team was TERRIFIC. It gave our entire technical Call Center a common foundation, and you seem to have crafted that perfect balance between technical depth, real-world applications, and lively delivery. I couldn't be happier with the results. The things my team learned from this training were applied in real-world situations almost immediately."

- Rusty Walther, Vice President, Client Services, AboveNet Communications

"The selection of material - the order of its presentation - the way it was presented... incredibly effective at presenting concepts and ideas - uses great analogies and stays on topic."

- Susan Lennon, Nortel

Whether you work for an organization that produces telecom, datacom or networking products or services; or you buy these products and services - or just have to get up to speed on what all the rest of them are talking about when they say "DS1", "Ethernet frame", "IP VPN", "CDMA", "codec" or "gateway"...

"Perfect content; well organized, well paced, building block approach, resulted in a very nice cathedral" - Jim George, Qualcomm

"Course was excellent! One of the best I have taken. Extremely well organized and presented. Seminar course book is outstanding - a very valuable reference" - Kieran Delaney, Maritime Life

"I liked most the use of analogies to explain complex concepts. It delivered exactly what the brochure promoted. Gave me a thorough understanding so I feel more confident."

- Judith Myers, Ameritech

"Excellent! Tied the individual pieces of knowledge together into a picture... was interactive and built up the knowledge layers properly." - Jim Geiss, Qwest

"Filled in a lot of gaps in my knowledge of networking... able to deliver the knowledge effectively and entertainingly. Excellent seminar"- Kirk Kroeker, IEEE Computer Society

"Layman's terms with humor was very relaxing - helped me concentrate... understanding is now CLEAR ... the manual will be very helpful" - Linda Côté, Bell Canada

"Best course materials ever; the full text descriptions are invaluable. Course filled in so many gaps for me. Bravo!" - Ross Brooks, Vertek

Detailed Descriptions of DVD-Video Courses

V1: Fundamentals of Telecommunications

The PSTN • Telephony • Telecom Equipment • The Telecom Industry

Length 142 minutes. DVD-R NTSC format. 55-page 8.5" x 11" softcover bound course book.

It all starts with the Public Switched Telephone Network (PSTN) and Plain Ordinary Telephone Service (POTS). We'll begin with the basics of telephony: loops, trunks, circuits, analog, the voiceband... fundamentals that are key to understanding of newer technologies and services.

To complete the picture, we take a practical journey through different types of equipment. We'll review switches, PBXs, Centrex, multiplexers and routers, as well as ancillary equipment like ACDs, voice mail and interactive voice response (IVR) systems.

With this framework in place, we'll review the telecommunications industry and understand the main players and competitors, how Local Exchange Carriers connect to Inter-Exchange Carriers and how CLECs fit into the picture.

The topics in this video course - how the telephone system and industry work, provide the essential foundation on which everything else, including digital communications, data circuits and networking are built.

Part 1 Fundamentals of Telephony

- 1.03 The Public Switched Telephone Network (PSTN)
- 1.05 Analog Circuits
- 1.07 What is Sound?
- 1.09 The Voiceband
- 1.11 Plain Ordinary Telephone Service (POTS)
- 1.13 DTMF Address Signaling
- 1.15 Signaling System 7 (SS7)

Part 2 Telecom Equipment

- 2.03 Telephone Switches
- 2.05 PBX vs. Centrex
- 2.07 Voice VPNs
- 2.09 Call Centers

Part 3 The Telecommunications Industry

- 3.03 US Domestic Telcos
- 3.05 AT&T and Verizon
- 3.07 Canadian Telephone Companies
- 3.09 PSTN Switching Centers Before Competition
- 3.11 Accessing The Interexchange Carriers
- 3.13 Competitive Local Exchange Carriers (CLECs)

Appendix A Acronyms and Abbreviations

V2: Fundamentals of Telecommunications 2

Voice Digitization • DS0-DS3 • Transmission • TDM • T1 • T3 • ISDN • SONET • Fiber • DWDM

Length 124 minutes. DVD-R NTSC format. 63-page 8.5" x 11" softcover bound course book.

In this video course, we drill into the technology a bit, to understand the concepts, standards and technologies for actually transmitting voice calls from one place to another. We'll give you a real understanding of what "digital" actually means, and how it is implemented. We'll explain what a "DS0" is, and take a practical tour of digital circuits, including T1, T3, SONET and ISDN. At a high level, we'll see how voice, data and video can be integrated. Then, we'll take a closer look at how this is all actually done, with Time Division Multiplexing (TDM) and digital carrier systems that are the technologies at the heart of telecommunications networks. Without getting bogged down on technical details, we'll provide you with a basic understanding of how transmission systems work, including T1 over copper wires and SONET over fiber.

Most of the transmission systems we have in place were designed for digital voice communications using these techniques... but they are also used for data and networking. This video course provides you with the concrete knowledge of the telecommunication circuits necessary to a full understanding of data circuits and network services.

Part 1 Digital Communications

- 1.03 Why Digital?
- 1.05 Analog and Digital: What Do We Really Mean?
- 1.07 Continuous Signals, Discrete Signals
- 1.09 Voice Digitization (Analog → Digital Conversion)
- 1.11 Voice Reconstruction (Digital → Analog Conversion)
- 1.13 Voice Digitization Summary
- 1.15 The Digital Hierarchy: Industry Standard Line Speeds
- 1.17 Popular Technologies: Digital Carrier Systems
- 1.19 ISDN BRI and PRI
- 1.21 Digital Circuit Voice Applications
- 1.23 Digital Circuit Data Applications
- 1.25 Digital Video
- 1.27 Integration: Voice, Video, Data

Part 2 Transmission Systems

- 2.03 Time Division Multiplexing
- 2.05 T1 Carrier System
- 2.07 T1 Basics: Multiplexers
- 2.09 Framing and Channels
- 2.11 Pulses and Repeaters
- 2.13 How T1 is Provided
- 2.15 Fibers and Cables
- 2.17 SONET and DWDM: Core Networks
- 2.19 International Digital Hierarchies

Appendix A Acronyms and Abbreviations

V3: Fundamentals of Datacom and Networking

WANs and LANs • MAC Frames vs. IP Packets • The Network "Cloud"

Length 106 minutes. DVD-R NTSC format. 65-page 8.5" x 11" softcover bound course book.

In this course, we'll begin by establishing a model for a data communications circuit, then provide examples and context for each of the components of the model, and review different circuit configurations including LANs and WANs.

In the second part, we'll look at how data is formatted for transmission, beginning with the older concepts of "synchronous" and "asynchronous", then cover the newer ideas of frames and packets, how frames and packets are related, and the addresses on frames and packets, and the structure of IPv4 packets.

We'll complete this course with an understanding of the "Network Cloud", why people use clouds to draw networks, and what is really going on inside that cloud.

This set of topics, particularly the understanding of packets and frames, the addresses on each, and how they are related; and the idea of three kinds of network services – and three kinds of edge equipment – is the foundation for all further study of LANs, WANs, IP and just about any other kind of communications, including Voice over IP.

Part 1 Introduction to Data Communications and Networking

- 1.03 Data Circuit Model
- 1.05 Data Terminal Equipment (DTE)
- 1.07 Analog and Digital Data Circuits
- 1.09 Data Circuit Terminating Equipment (DCE)
- 1.11 Configuration Example: Point-to-Point
- 1.13 Multidrop Circuits
- 1.15 LANs
- 1.17 Wide Area Networks

Part 2 How Data is Formatted for Transmission

- 2.03 Data Communications Basics: Bits and Bytes
- 2.05 ASCII Code Set
- 2.07 "Asynchronous"
- 2.09 Frames
- 2.11 Details for Reference: Cyclic Redundancy Check
- 2.13 Packets
- 2.15 Packets vs. Frames
- 2.17 IP Packets

Part 3 The Network "Cloud": How Data Circuits are Actually Provisioned

- 3.03 Anatomy of a Digital Circuit
- 3.05 Common Carriers' Transmission Networks
- 3.07 Network Equipment: How and Where Each is Used

Appendix A Start, Stop, Parity

Appendix B Acronyms and Abbreviations

V4: Understanding Networking 1

OSI Layers • Protocol Stacks • The FedEx Analogy

IP Addressing, DHCP, NAT • Bandwidth on Demand Services • Frame Relay • ATM • MPLS

Length 127 minutes. DVD-R NTSC format. 58-page 8.5" x 11" softcover bound course book.

This course builds on the basic packet, frame and IP networking concepts of Course V3, Fundamentals of Datacom and Networking, to put in place a solid understanding of protocol stacks, the OSI model and layers and IP addressing including address classes, static vs. dynamic public vs. private and network address translation.

In Part 3, we move to the next higher level of knowledge, understanding packet networks and bandwidth on demand services from telecommunication service providers. After understanding the core concepts, including virtual circuits, we use the grand-daddy of packet services, X.25 to explain jargon: connection-oriented vs. connectionless and reliable vs. unreliable packet networks. Then we progress through technologies: Frame Relay, ATM and finish with MPLS. We'll trace the flow of TCP and IP packets from server to client across Frame Relay, then see how the same TCP/IP works over MPLS.

IP over MPLS will end up replacing all other services including ISDN, T1s, Frame Relay, native ATM. Understanding the OSI layers, how a protocol stack works and TCP/IP over MPLS is career-enhancing knowledge.

Part 1 Protocol Stacks and the OSI 7-Layer Reference Model

- 1.03 Protocols and Standards
- 1.05 ISO OSI Reference Model
- 1.07 OSI 7-Layer Model
- 1.09 Protocol Stacks
- 1.11 Protocol Stack in Operation

Part 2 IP

- 2.03 IP Address Classes
- 2.05 Dynamic IP Addresses
- 2.07 IP Addresses for Private Networks
- 2.09 Network Address Translation

Part 3 WANs – Bandwidth On Demand: Packet Network Services

- 3.03 Statistical TDM
- 3.05 Bandwidth On Demand Service Concepts
- 3.07 Virtual Circuit Technologies
- 3.09 X.25 and Jargon
- 3.11 Frame Relay
- 3.13 TCP/IP over Frame Relay
- 3.15 Frame Relay Performance: CIR and BIR
- 3.17 ATM: Capacity Management
- 3.19 MPLS
- 3.21 TCP/IP Over MPLS

Appendix A Acronyms and Abbreviations

V5: Understanding Networking 2

The Internet • ISPs • The Web • IP Security • Viruses • Firewalls • Encryption • IPsec • VPNs

Length 151 minutes. DVD-R NTSC format. 64-page 8.5" x 11" softcover bound course book.

In this course, we cover the Internet and IP Security.

We'll start at the beginning of the story, understanding where the Internet came from and its fundamental principles of operation. Then we'll look at some details and improvements such as the Domain Name System, MIME, HTML and HTTP... which form "the Web". We'll review how you can connect to the Web from a residence and from an enterprise or organization.

In the second part, we'll make a reasonably comprehensive overview of security in the IP world. We'll begin with a discussion of risk areas, vulnerabilities and measures. Then we'll examine several areas: computer security and malicious software like viruses and Trojan Horses and the measures to protect against these risks; network security and firewalls, public key and private key encryption, authentication, IPsec and VPNs.

This video provides you with a real understanding of what the Internet is, how it functions and current issues, plus practical knowledge of computer security, network security and firewalls, encryption, IPsec and VPNs.

Part 1 Understanding The Internet

- 1.03 Internet History
- 1.05 Internet Basics
- 1.07 TCP and UDP
- 1.09 Internet Service Provides
- 1.11 Commonly Used Internet Protocols
- 1.13 Domain Name System
- 1.15 MIME and Base-64 Encoding
- 1.17 World Wide Web
- 1.19 HTML, HTTP and HTTPS
- 1.21 Accessing the Internet: Home Connections
- 1.23 Accessing the Internet: Organization Connections

Part 2 IP Security

- 2.03 Risk, Measures and Policy
- 2.05 Viruses
- 2.07 Trojan Horses, Denial of Service Attacks, Spyware and Exploits
- 2.09 Network Segmentation and Perimeters
- 2.11 Packet Filtering
- 2.13 Firewall Proxies
- 2.15 Stateful Packet Inspection
- 2.17 Encryption
- 2.19 Authentication
- 2.21 IPsec
- 2.23 Customer-Premise-Based VPN
- 2.25 Carrier VPNs

Appendix A Acronyms and Abbreviations

V6: Understanding Wireless

Radio Fundamentals • Spectrum • Digital Radio • Mobile Network Components and Operation • Cellular Principles • Digital Voice • Data • Mobile Internet • Cellular Technologies • TDMA • CDMA • OFDM • Generations • 2G GSM • 3G 1X • UMTS • HSPA • 4G LTE • Fixed Wireless • Bluetooth • WiFi • WiFi Security • Encryption • WiMAX • Point-to-Point Microwave • Satellite

Length 185 minutes. DVD-R NTSC format. 74-page 8.5" x 11" softcover bound course book.

Understanding Wireless is a complete course covering fundamentals, mobile and fixed wireless.

Part 1 begins the course with radio fundamentals, spectrum, analog and digital radio. With a good foundation in place, Part 2 covers mobile communications from A-Z: cellular principles, digital voice, data over cellular, mobile Internet access, the technologies: FDMA, TDMA, CDMA and OFDM, and the generations: 2G GSM, 3G 1X, UMTS and HSPA and 4G LTE. Part 3 rounds out your knowledge with fixed wireless: lessons on Bluetooth, 802.11 wireless LANs, WiFi, WiFi security, WiMAX, point-to-point microwave, and satellite.

Over 3 hours long and including 28 lessons, this video course provides you with a real understanding of how radio works, how a cellular network operates, the cellular technologies and generations, plus WiFi and much more. This is the core knowledge set required to be a Wireless Analyst. Get this upgrade to your marketable skills today!

Part 1 Fundamentals

- 1.03 Wireless
- 1.05 Wireless Spectrum and Radio Bands
- 1.07 Analog Radio
- 1.09 Digital Radio: Modems
- 1.11 Propagation, Penetration and Fading

Part 2 Mobile Communications

- 2.03 Mobile Network Components and Operation
- 2.05 Cellular
- 2.07 1G: Analog Frequency-Division Multiple Access
- 2.09 Second Generation: Digital Cellular
- 2.11 Digital Cellular: Voice Communications
- 2.13 Internet Access via Cellular: "Data" Communications
- 2.15 2G: TDMA (IS-136) Time-Division Multiple Access
- 2.17 2G: TDMA (GSM) Time-Division Multiple Access
- 2.19 2G: CDMA Code-Division Multiple Access
- 2.21 Spread Spectrum
- 2.23 CDMA Operation and Patents
- 2.25 3G: CDMA 1X and UMTS
- 2.27 4G: LTE
- 2.29 4G: OFDM
- 2.31 Dynamic Assignment of Subcarriers
- 2.33 Spectrum-Sharing Roundup: FDMA, TDMA, CDMA, OFDM

Try before you buy!
Full lesson available as a
free sample on YouTube!

Part 3 Fixed Wireless

- 3.03 Infrared
- 3.05 Bluetooth
- 3.07 WiFi: Wireless LANs
- 3.09 WiFi Security and WPA2
- 3.11 802.16 WiMAX
- 3.13 Point-to-Point Microwave
- 3.15 Satellite

Appendix A Acronyms and Abbreviations

V8: Understanding Voice over IP 1

Components • Standards • Architectures

134 min. DVD-R NTSC format. 60-page 8.5" x 11" softcover bound course book.

Teracom's *Understanding VoIP* is a comprehensive set of multimedia video courses on DVD designed for those needing to get up to speed on and understand Voice over IP technologies, buzzwords, jargon and mainstream solutions, and importantly, the ideas and fundamental concepts underlying VoIP, independent of any particular vendor's viewpoint... knowledge you can't get reading trade magazines or talking to salespeople.

Featuring detailed graphics, bullets, extensive text notes and our engaging and often humorous instructor Eric Coll, M.Eng., P.Eng., these training courses will give you the solid foundation you need to intelligently discuss, compare, evaluate and understand VoIP technologies, products and implementations.

We'll get started with a big-picture view of VoIP, identifying and explaining key components, jargon and buzzwords, standards and protocols. Then we'll review the many flavors of VoIP, comparing and contrasting implementation and architecture choices. Starting with Internet telephony and progressing through Managed IP Telephony, PBX replacement, Hosted PBXs, IP Centrex and Asterisk, you'll gain the knowledge you need to confidently differentiate VoIP architectures and discuss pros and cons of different implementation options.

Chapter 1 VoIP Systems, Components, Standards, Jargon and Buzzwords

- 1.03 The Big Picture
- 1.05 Terminals
- 1.07 Voice in IP Packets
- 1.09 Soft Switches / SIP Servers / Call Managers
- 1.11 Media Servers
- 1.13 Gateways
- 1.15 LANs and WANs
- 1.17 Key VoIP Standards
- 1.19 Where All of This is Headed: Broadband IP Dial Tone

Chapter 2 VoIP Architectures and Implementation Choices

- 2.03 Computer-Computer VoIP over the Internet
- 2.05 Skype and IM
- 2.07 Computer to Phone e.g. SkypeOut (DS0 Interconnect to LEC)
- 2.09 Phone to Phone over the Internet e.g. Vonage
- 2.11 Managed IP Telephone Service (MIPT)
- 2.13 IXCs and IP-based Backbones
- 2.15 VoIP for Businesses and Organizations
- 2.17 VoIP-Enabled PBX and Migration Options
- 2.19 PBX Replacement
- 2.21 Hosted PBXs
- 2.23 IP Centrex
- 2.25 Asterisk and Open-Source IP-PBX Software
- 2.27 SO/HO IP Phone Features and Uses

Appendix A Acronyms and Abbreviations

V9: Understanding Voice over IP 2

Voice Packetization • Voice Quality • Codecs, Jitter, Packet Loss • Diff-Serv • QoS with MPLS

Approx. 119 min. DVD-R NTSC format. 48-page 8.5" x 11" softcover bound course book.

Teracom's *Understanding VoIP* is a comprehensive set of multimedia video courses on DVD designed for those needing to get up to speed on and understand Voice over IP technologies, buzzwords, jargon and mainstream solutions, and importantly, the ideas and fundamental concepts underlying VoIP, independent of any particular vendor's viewpoint... knowledge you can't get reading trade magazines or talking to salespeople.

Featuring detailed graphics, bullets, extensive text notes and our engaging and often humorous instructor Eric Coll, M.Eng., P.Eng., these training courses will give you the solid foundation you need to intelligently discuss, compare, evaluate and understand VoIP technologies, products and implementations.

The next course in this series explains how voice is packetized, the factors affecting quality and methods for voice quality in the VoIP system and on the IP network. We'll cover voice digitization and the RTP protocol, then give you a thorough understanding of codecs and compression including G.711 and G.729, as well as delay, jitter and packet loss, why they are important and how they are corrected. In the second part, you'll understand MPLS, Differentiated Services (Diff-Serv), traffic conditioning, Service Level Agreements and Quality of Service (QoS) on IP networks.

Chapter 1 Voice Packetization, Codecs and Voice Quality

- 1.03 Voice Packetization
- 1.05 Measuring Voice Quality
- 1.07 Factors Affecting Voice Quality
- 1.09 Codecs: Voice Coding and Compression
- 1.11 Delay
- 1.13 Jitter
- 1.15 RTP
- 1.17 Protocol Stack: RTP, UDP, IP, MAC
- 1.19 Packet Loss
- 1.21 Tips for Maximizing Voice Quality

Chapter 2 QoS: Quality of Service in the IP World

- 2.03 Virtual Circuit Technologies
- 2.05 MPLS
- 2.07 Differentiated Services (Diff-Serv)
- 2.09 Meters, Markers, Shapers and Droppers
- 2.11 Interworking Diff-Serv and MPLS
- 2.13 802.1P
- 2.15 Implementing QoS: Queuing Techniques

Appendix A Acronyms and Abbreviations

V10: Understanding Voice over IP 3

SIP and IP Call Flow • Carrier Interconnect • Megaco

Approx. 116 min. DVD-R NTSC format. 54-page 8.5" x 11" softcover bound course book.

Teracom's *Understanding VoIP* is a comprehensive set of multimedia video courses on DVD designed for those needing to get up to speed on and understand Voice over IP technologies, buzzwords, jargon and mainstream solutions, and importantly, the ideas and fundamental concepts underlying VoIP, independent of any particular vendor's viewpoint... knowledge you can't get reading trade magazines or talking to salespeople.

Featuring detailed graphics, bullets, extensive text notes and our engaging and often humorous instructor Eric Coll, M.Eng., P.Eng., these training courses will give you the solid foundation you need to intelligently discuss, compare, evaluate and understand VoIP technologies, products and implementations.

The third course explains SIP and how connections are made. You'll understand the SIP trapezoid, how it works, demystify jargon like proxy server and location server, understand how SIP fits in with softswitches and call managers, and trace the establishment of an IP phone call step by step. In the second part, we'll cover connecting to carriers using traditional DS0 PBX trunks and PRIs, how Megaco fits in to the story, plus IP interconnect, co-existence with legacy systems, integrated messaging and more.

Chapter 1 SIP and Call Flow in the IP World

- 1.03 What SIP Is and What It Can Do
- 1.05 Relationship to Other Protocols
- 1.07 SIP URIs: "Telephone Numbers"
- 1.09 Register: Update Your Location
- 1.11 INVITE: "Dialing"
- 1.13 Location Service: Finding the Far End
- 1.15 The SIP Trapezoid
- 1.17 SIP Message Example
- 1.19 How SIP Relates to Softswitches and Call Managers
- 1.21 SDP: Session Description Protocol
- 1.23 SIP Glossary

Chapter 2 Carrier Interconnect

- 2.03 Internet → PSTN Interconnect via DS0 (Vonage / SkypeOut)
- 2.05 Internet → PSTN Interconnect via IP
- 2.07 Session Border Controllers
- 2.09 Carrier ↔ Business Interconnect Using DS0 and SIP
- 2.11 Interconnect using MEGACO
- 2.13 Carrier ↔ Business Interconnect Using IP and SIP
- 2.15 Co-Existence with a Legacy PBX
- 2.17 Integrating Integrated Messaging

Appendix A Acronyms and Abbreviations

About the Course Director



Eric Coll is an international expert in telecommunications, data communications and networking and has been actively involved in the industry since 1983. He holds Bachelor's and Master of Engineering (Electrical) degrees, and is licensed as a Professional Engineer in his home jurisdiction.

Mr. Coll has taught telecommunications technology training seminars to wide acclaim across North America since 1992, and has broad experience working as an engineer in the telecommunications industry.

He has worked for Nortel's R&D labs as a design engineer on projects including digital voice and data communications research and digital network equipment design; and on satellite radar systems; consulting on Wide Area Network design for HMO applications; and many other projects in capacities ranging from detailed design and implementation to systems engineering, project leader and consultant.

In addition to being a Course Director for Teracom Training Institute, Mr. Coll provides consulting to the telecommunications industry as a subject matter expert in tax matters.

Please visit teracomtraining.com/video-previews.htm for previews of all courses.