



ExperTech 2.0: Telephony Fundamentals

PROGRAM OVERVIEW

The ExperTech 2.0 series is a library of CD-ROM or intranet-based products covering key communications topics. Seminar style presentations provide telecom professionals with easy access to the information they need. Topics are presented by Hill Associates instructors renowned for their technical expertise, industry experience, and outstanding presentation style.

This course covers fundamental concepts related to voice networks. The course emphasizes circuit-based voice networks, but it also includes an overview of packet-based voice networks. Concepts covered include industry history, network elements and organization, voice digitization, signaling, access and trunking options, traffic engineering concepts, and regulatory issues.

Telephony Fundamentals runs 3.6 hours, and includes audio, interactive elements, review slides, section knowledge checks, and a final exam. The participant can expect to spend about twice this amount of time to complete the course.

This program has eight primary objectives:

- Describe the history of the telephone industry
- Describe the components of the telephone network
- Differentiate between analog/digital and information/signals, and provide examples to underscore the concepts
- Describe the four steps used in the digitization of voice
- Differentiate between circuit and packet voice networks
- Describe how the telephone network is engineered for quality of service
- Explain the operation of a signaling network (e.g., SS7)
- Identify and describe trunking options

Specific topics can be developed, or packaged together to create a unique and customizable curriculum. All of our standard titles are available for preview at our store (www.hill.com/store).

About Hill Associates

At Hill Associates, we excel at creating custom talent development programs. Our experts help identify and assess your needs, and create training and educational programs that exactly meet those needs. Though we specialize in information technology, we've strengthened companies and organizations in a wide range of industries for over 25 years. Let us help you create a world-class talent development program that moves your business forward.

PROGRAM OUTLINE

Lesson 1: The telephone is invented

- Milestones
- Terminology (LATA, LEC, IXC, ITSP)

Lesson 2: The Telephone Network

- Understanding sound propagation
- The traditional ILEC PSTN network, connecting to IXC
- PBX, key systems, Centrex
- Traditional vs. IP Telephony

Lesson 3: Voice Transmission

- Terminology (frequency, passband, TDM, analog vs. digital; content vs. signaling)
- Digitizing voice (sampling, quantizing, companding, encoding per Shannon and Nyquist)

Lesson 4: Switching

- Types of switches
- Media gateway functionality

Lesson 5: Traffic Engineering

- Blocking vs. queuing
- Erlang calculations
- Trunk groups, law of large numbers
- Packet voice systems

Lesson 6: Signaling and SS7

- Purpose of signaling
- In-band vs. out-of-band
- The SS7 network

Lesson 7: Access Options

- POTS, ISDN, DSL, HFC, cellular systems

Lesson 8: Trunking Options

- T-Carrier (T-1/3), SONET