



Optical Networking

PROGRAM OVERVIEW

This course examines fiber-optic transmission and the major components of an optical networking system. Dense wavelength division multiplexing (DWDM) is explained, as well as the importance of optical amplification to achieve cost-effectiveness. We take a detailed look at the technologies that make the optical network a reality. Specifically, the use of diffraction gratings to create optical add/drop multiplexers is discussed, as is the many techniques for switching at the optical level. Optical networking standards from the ITU-T and the Optical Internetworking Forum (OIF) are presented in depth. Finally, current and emerging applications are presented and discussed.

A familiarity with optical networks (e.g., SONET/SDH and DWDM) will help participants grasp this content. Some knowledge of the quantum behavior of light would also be helpful for participants to understand the material, but is not necessary.

The program has seven primary objectives.

- Define the concept of all-optical (“lambda”) networking, examining the effect of the optical network on global bandwidth capacity
- Trace the emergence of all-optical networking technologies, including optical add/drop multiplexing and optical switching
- Describe the components of a fiber transport system, including signal emitters (LEDs and lasers), various fiber types (multimode and single-mode), and photodetectors (PIN diodes)
- Explain the operation of dense wavelength division multiplexing (DWDM) systems, including the major limitations that can occur in DWDM systems
- Discuss standardization activities in the optical networking environment
- Introduce current and future applications of the optical network
- Describe at least four emerging applications for all-optical networking technologies

Hill Associates can customize this program to address your specific Sales Engineering talent development program goals. We will work with you to identify the specific technologies and solutions you wish to discuss, to understand your particular competitive market, and develop case studies that focus on unique challenges facing your customers.

About Hill Associates, Inc.

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: Introduction to Optical Networking

- Explore optical networks and the current status of global bandwidth
- Discuss the drivers of optical bandwidth consumption

Lesson 2: Anatomy of an Optical Span

- Explain signal emitters (LEDs/lasers), single-mode and multi-mode fiber types, non-zero dispersion shifted fiber and signal detectors (PIN/avalanche photodiodes)

Lesson 3: Dense Wavelength Division Multiplexing (DWDM)

- Explain basic DWDM systems, comparing active versus passive approaches
- Explore optical amplification approaches / impairments, REDFAs, Raman and semiconductor optical amplifiers
- Discuss stimulated Raman and Brillouin scattering, multi-wave mixing, and self-phase modulation

Lesson 4: Optical Network Components / Configurations

- Explain optical terminal and add/drop multiplexers, optical switching alternatives and DWDM topologies

Lesson 5: ON Standards

- Discuss G.872 (OTN), G.807 (ASTN), ITU-T and OIF UNI 1 standards

Lesson 6: Applications and Services

- Explore various optical services including wavelength, dynamic IP trunking, optical dial tone, VPNs, ASP, and SANs