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Telecom Basics

1 - Telecommunications for Non-Engineers

Duration: 2 Day(s)

Tonex telecom training course for non-engineers provides an introduction to the landscape and fundamental technologies of the telecommunications marketplace. Designed with the non-technical professional in mind, this course provides day-to-day examples of the intricacies and competitive landscape of the industry.

Most importantly, telecom fundamentals for non-engineers provides crucial insights into fast-changing and dynamic competitive landscape, regulations and impact of new technologies.

Prerequisites: This is an introductory course with no prerequisites.

For detailed information: www.tonex.com/Courses/100/100/

2 - Telecommunications Fundamentals Level I

Duration: 2 Day(s)

Telecom training level I provides an overview of the past and modern telecom industry, concepts, technologies and trends. Explore the telecom landscape from standards and protocols to premise, access, signaling, and transport and convergence technologies. Students will understand telecom protocols, basic telephony, premises technologies, access and transport technologies, public and private voice and data convergence, Voice over IP (VoIP), Softswitch, IMS, multimedia, IPTV, MPLS, VPNs, optical networking, VPLS, fixed and mobile wireless including SATCOM, VSAT, WiFi, WiMAX, GSM family of technologies: GPRS, EDGE, EDGE II, UMTS/HSPA/HSPA+,

Objectives

After successfully completing this course the attendees will

- Understand the communications industry structure, how it is changing, and how it affects competition
- Comprehend the basics of voice and data communications technologies
- Understand the differences between analog and digital transmission
- Understand the components of voice networks
- Understand private voice and data network design alternatives
- Understand basics of voice traffic engineering
- Understand the basics of local and wide area networks (LANs, WANs)
- Understand technologies such as frame relay, ATM, Ethernet and TCP/IP
- Understand xDSL, cable modems, and wireless technologies
- Understand what is happening in voice/data/multimedia convergence
- Understand voice over IP, cable, DSL, Frame Relay, and ATM
- Explore optical networking and wireless technologies
- Explore wireless technologies
- Apply best practices to deploy converged network

Prerequisites: This is an introductory course with no prerequisites.

For detailed information: www.tonex.com/Courses/100/101/

209 - CALEA Fundamentals

Duration: 2 Day(s)

CALEA (Commission on Accreditation for Law Enforcement Agencies) is about access, not authority. CALEA does not expand Law Enforcement's fundamental statutory authority to conduct electronic surveillance. It simply seeks to ensure that after Law Enforcement obtains the appropriate legal authority, telecommunications carriers will have the necessary capability, and sufficient capacity, to assist Law Enforcement regardless of their specific systems or services.

The objective of CALEA implementation is to preserve Law Enforcement's ability to conduct lawfully-authorized electronic surveillance while preserving public safety, the public's right to privacy, and the telecommunications industry's competitiveness. CALEA implementation responsibilities are delegated to the Federal Bureau of Investigation by the Attorney General at 28 C.F.R. § 0.85(o).

Prerequisites: Telecom background and a general knowledge of PSTN.

For detailed information: www.tonex.com/Courses/100/209/

308 - PBX Fundamentals

Duration: 2 Day(s)

A Private Branch Exchange (PBX) or a Private Automatic Branch Exchange (PABX - which is out of fashion since all modern day PBXs are automatic), is a phone switch serving a business or organization and is usually located on the organization's premises. The PBX provides phone services including internal calling, and access to the public switched telephone network. It allows a small number of outside lines to be shared among all of the people of the organization. Advanced PBX phone switches sometimes provide auto-attendant, voice-mail, and ACD (automatic call distribution) services for the organization

Objectives

Upon completion of this course, the attendees will:

- Understand Private Branch Exchange (PBX) and Key Telephone System (KTS)
- Learn about integration of PBX with ACD, CTI, and IVR
- Understand PBX Systems and Technology
- Understand major innovations, including the shift from analog to digital transmission and switching, the introduction of stored program-controlled PBX systems, and advances in KTS/Hybrid systems
- Understand residual value assessment for VoIP equipment
- Learn about Centrex services

Prerequisites: This is an introductory course with no prerequisites.

For detailed information: www.tonex.com/Courses/100/308/

1010 - Information & Communication Technologies (ICTs) Training

Duration: 2 Day(s)

TONEX's Information and communication technology (ICTs) course covers topics such as office automation, production automation, telecommunication and electronic networks connecting organizations.

The impact of the introduction of ICT becomes apparent in changes in work patterns, qualifications and decision-making procedures. In this course, the implementation processes and some of the consequences are discussed including topics of recent developments of ICT and organizational changes from new technologies, especially in the computer and telecommunication industries. The workshops cover formulation for the liberalization of the telecommunication sector, the development of electronic commerce, the governance of universal access, and developing country responses to globalization.

Objectives

The learning objectives for this course are to assist participants in understanding ICTs and creating a plan to kick start ICT in emerging markets and reach out to the people, such as the "Shared Access," "Telemedicine," "SMBs Program," "eGovernment", and/or "eLearning" programs for addressing the digital divide in their countries, including:

- Accessibility
- Connectivity
- Rural Healthcare
- Education
- Content
- Green Energy

The participants will explore topics such as:

- Information & Communication Technologies for Development (ICT4D)
- Development of ICT Strategies & Action Plans for Government and Businesses
- Funding ICT for Development (ICT4D) Projects
- Current Trends in the Use of ICTs for Development
- ICTs for Poverty Reduction
- ICTs for Empowerment of Women
- Managing E-Government & ICT Projects
- Agricultural, Justice, Education, Environment, Energy Sectors ICT Strategy Development & Implementation
- Green Energy and IT
- Planning & Implementing Community Access Facilities
- Low Cost Computing Devices

For detailed information: www.tonex.com/Courses/100/1010/

8000 - Introduction to Telecom Business Trends and Analysis

Duration: 2 Day(s)

The course provides strategic analysis of key regulatory, technical, and financial trends impacting the established and new entrant service providers. It analyzes the technology trends underlying many of strategies and the principles the executives are applying as they attempt to build new businesses. A hands-on, applications-based workshop for analytically oriented planners and managers. Drawing heavily on examples and recent forecasts from the telecom industry, this seminar provides the participant with an excellent overview of trends in the telecom industry.

Objectives

Telecom Business Trends and Analysis graduates understand:

- Business & Technology Strategy Analysis in Communications
- Emerging Telecom Markets and Technologies for Multimedia, Data and Voice (including both wireline and wireless)
- A broad perspective on changes affecting all aspects of telecommunications
- Service Portfolio and Strategy
- Sustainable Competitive Advantages
- Near-Term and Long-Term Vulnerabilities
- Core Business Strategy and Key Alliances
- Business and Operation Support Systems (OSS/BSS)
- Telecom Business Processes Global Outsourcing
- Role of Executives, Financial Standing, Core Technologies, Target Markets/Geographic and Markets Served

For detailed information: www.tonex.com/Courses/100/8000/

Advanced Telecom

102 - Telecommunications Fundamentals Level II

Duration: 2 Day(s)

Telecommunications Fundamentals Level II provides a thorough technical overview of modern telecom, data and convergent networks by utilizing Tonex Roadmaps™. Participants will acquire an understanding of how current advancements will fit into today's networks to build the next generation of telecommunication services.

Objectives

Upon completion of this course attendees will:

- Understand the details of telecom networks and technologies
- Understand advanced data communications concepts
- Understand IP Networking
- Exploit the capabilities of next-generation networks
- Understand fixed and mobile wireless
- Exploit the capabilities of wireless networks
- Design and manage telecom converged network
- Leverage communication technologies and protocols for voice, data and video convergence
- Apply best practices to plan, design, implement and manage converged network

Prerequisites: This is an advanced course with Telecommunications for Beginners as a prerequisite.

For detailed information: www.tonex.com/Courses/110/102/

103 - SS7 Fundamentals

Duration: 2 Day(s)

The dramatic increase in Internet traffic is driving the need to standardize strategies for offloading data from the circuit-switched network and optimizing the performance of IP-centric next generation networks. The PSTN is expected to continue providing the vast majority of residential users with access to the Internet and other data services. Ss7 Fundamentals provides a thorough introduction to SS7. Signaling System #7 Fundamentals training is the hands-down choice for engineers and network managers everywhere. It gives you a bedrock understanding of the signaling network, its architecture, and the protocols used to communicate through it.

Objectives

Upon completion of this course, the participant will have a through understanding of:

- SS7 (Signaling System 7) Network Architecture
- SS7 Protocol Stack
- Signaling Network Elements: SSPs, STPs and SCPs
- Signaling Network Structures
- SS7 Signal Units
- Signaling Links
- SS7 Protocols
- Message Transfer Part (MTP) Level 1-3
- SCCP, TCAP and ISUP
- SS7 in Mobile Networks
- MAP, CAMEL and CAP
- SS7 in Next-Generation Networks
- SS7 and VoIP
- SS7 Enabling Products
- SS7 Troubleshooting, Configuration and Testing Scenarios

Prerequisites: This is an introductory course with no prerequisites.

For detailed information: www.tonex.com/Courses/110/103/

104 - VoIP Fundamentals

Duration: 2 Day(s)

This practical course provides an extremely comprehensive, up-to-date, and easy-to-understand treatment of CAMEL (Customized Applications for Mobile network Enhanced Logic).

Objectives

After completing this course, students will be able to:

- Understand the basics of SS7 (Architecture and protocols, MTP, SCCP, TCAP, MAP and CAP)
- Understand the basics behind GSM, GPRS and IMS Procedures
- Understand the basics behind SMS and USSD
- Learn the basic GSM, GPRS and UMTS Service Architecture
- Understand the basics of IN Services Applied to Mobile
- Understand and Basic Concepts behind IN Service Creation
- Explain Basic IN and AIN
- Explain Basic CAMEL Architecture
- Learn how CAMEL applies to GSM, GPRS, and IMS

105 - CAMEL Fundamentals

Duration: 3 Day(s)

This practical course provides an extremely comprehensive, up-to-date, and easy-to-understand treatment of CAMEL (Customized Applications for Mobile network Enhanced Logic).

Objectives

After completing this course, students will be able to:

- Understand the basics of SS7 (Architecture and protocols, MTP, SCCP, TCAP, MAP and CAP)
- Understand the basics behind GSM, GPRS and IMS Procedures
- Understand the basics behind SMS and USSD
- Learn the basic GSM, GPRS and UMTS Service Architecture
- Understand the basics of IN Services Applied to Mobile
- Understand and Basic Concepts behind IN Service Creation
- Explain Basic IN and AIN
- Explain Basic CAMEL Architecture
- Learn how CAMEL applies to GSM, GPRS, and IMS

Prerequisites: None

For detailed information: www.tonex.com/Courses/110/105/

106 - Computer Telephony Integration (CTI) Fundamentals

Duration: 2 Day(s)

CTI or Computer Telephony Integration, involves integrating computer systems with telephony resources to augment the capabilities of a call center. The CTI Fundamentals explains the concepts and ideas behind the CTI and its applications. The course covers CTI concept, technology, architecture, design, deployment and tools.

For detailed information: www.tonex.com/Courses/110/106/

108 - Softswitch Planning, Design and Implementation

Duration: 4 Day(s)

Softswitch are software products that can replace very expensive hardware in VoIP systems. Having completed this course the participants will be able to understand carrier-grade softswitch concepts and how softswitch is implemented, deployed and managed in today's networks. This comprehensive course which explores softswitch applications, protocols and platforms, gives the attendees an inside look at the software.

Aimed at network planners and system integrators at carriers and service providers, softswitch vendors, and at developers of high-value services, this course aims to demystify the rationale behind softswitching and clearly explains what makes it tick, what are the drawbacks, where's the hype, and whose claims can we believe? It sets out to help attendees understand how softswitch will affect their systems, services and vendors, and it explores how to get hardware-style quality, salability and signaling from a softswitch. The course is about the definition, need and scope of the softswitch from both a technical and service perspective.

If you want to know more about softswitch and its role in the next generation voice, broadband, and wireless networks, you should attend this excellent course on softswitch technology as the enabling platform for next-generation packet communications.

The course does an outstanding job of showing how softswitch technology and applications enable global service providers and carriers to optimize their networks and generate new revenue streams with new services and applications. In other words, the course explores how softswitch technology disrupts incumbent service providers and their vendors. The course helps to identify some of the success and technological challenges of the industry based on the softswitch.

Objectives

After completing this course, students will be able to:

- Explain the basics of VoIP
- Understand the engineering tools and procedures required for a voice network
- Understand existing and emerging standards for VoIP
- Explain the concepts of carrier-grade VoIP
- Explore Softswitch Technologies
- Understand Regulatory Compliance
- Explain Softswitch Network Features
- Review Subscriber Features Supported by Softswitch
- Discuss Softswitch Interworking
- Review Softswitch Operations, Maintenance, and Troubleshooting (OAM&P)
- Explain performance and voice quality considerations
- Explore project planning process of Softswitch
- Review successful VoIP deployments for wireline, wireless, and cable operators
- Discuss successful and unsuccessful Softswitch deployments (VoIP, ATM and PSTN)
- Step through a practical process for managing a Softswitch deployment project
- Explore the current and future market trends

Prerequisites: Basic understanding of the PSTN, SS7 and IP is recommended.

For detailed information: www.tonex.com/Courses/110/108/

109 - Session Initiation Protocol (SIP) Fundamentals

Duration: 2 Day(s)

SIP, the Session Initiation Protocol, is a signaling protocol for conferencing, telephony, presence, events notification and instant messaging.

It is an application-layer control (signaling) protocol for creating, modifying and terminating sessions with one or more participants. These sessions include Internet multimedia conferences, Internet telephone calls and multimedia distribution. Members in a session can communicate via multicast or via a mesh of unicast relations, or a combination of these. Session Initiation Protocol (SIP) builds on the IP communications foundation by providing a standards-based approach to enabling IP communications with numerous devices and applications.

SIP invitations used to create sessions carry session descriptions which allow participants to agree on a set of compatible media types. SIP supports user mobility by proxying and redirecting requests to the user's current location. Users can register their current location. SIP is not tied to any particular conference control protocol. SIP is designed to be independent of the lower-layer transport protocol and can be extended with additional capabilities. Session controllers promise to enable the same ubiquity, quality, and security for VoIP that the PSTN offers today, only in the more flexible, efficient, and economical manner that IP makes possible.

The SIP fundamentals course provides an overview of SIP, its components, and how it works. It covers data networking principles to telco engineers and signaling principles to IP engineers. It also outlines SIP implementations on the market in the form of single-line gateways, proxy servers, media gateways, Java toolkits, encoders/decoders and session authenticators.

Individuals who wish to develop a basic knowledge of SIP. Essential course for anyone involved in the development and operation of voice or data networks, wireless communications protocol, mobility technologies, and instant messaging.

Objectives

After successfully completing the course the attendees will:

- Understand basics of VoIP
- Explore Where, why, and how SIP is used
- Comprehend the basics of SIP
- Understand the architect and components of SIP
- Understand the differences between SIP and H.323
- Understand H.323-SIP-SS7 Interworking
- Review SIP-T concept and architecture
- Understand how to size up and choose from available SIP products

Prerequisites: This is an introductory course with no prerequisites.

For detailed information: www.tonex.com/Courses/110/109/

110 - Media Gateway Control Protocol (MGCP) Fundamentals

Duration: 2 Day(s)

The 2-day training course: "Media Gateway Control Protocol (MGCP) Fundamentals" provides in-depth coverage of VoIP and MGCP.

Media Gateway Control Protocol (MGCP) is a protocol used for controlling Voice over IP (VoIP) Gateways from external call control elements. MGCP is the emerging protocol that is receiving wide interest from both the voice and data industries.

MGCP and Megaco / H.248 are control protocols designed to be used between a Media Gateway Controller (MGC) or call agent and a media gateway (MG).

Objectives

After completing this course, students will be able to:

- Explain the basics of MGCP
- Review of Session Description Protocol (SDP)
- Explore MGCP Commands
- Explore MGCP Messages and Parameters
- Understand differences and similarities between MGCP and Megaco/H.248

Prerequisites: Professionals and managers who are interested in MGCP

For detailed information: www.tonex.com/Courses/110/110/

112 - Next Generation Networks (NGN) Training Boot Camp

Duration: 5 Day(s)

This unique course goes beyond all the Next Generation Networks (NGN). The NGN training boot camp is one of the premier courses in advanced networking and IT/communications technologies, bringing together industry expert instructors and pioneering participants to explore, discuss and learn about the technologies, business opportunities and new applications for advanced networks.

Prerequisites: None

For detailed information: www.tonex.com/Courses/110/112/

309: 10 Gigabit Ethernet Training

Duration: 5 Day(s)

10 Gigabit Ethernet will be of immediate use to carriers looking to provide low-cost, high-speed Ethernet services to businesses with metro area network (MAN) services. Over the next several years, enterprises are expected to adopt 10 Gigabit Ethernet as a switch-to-switch interconnect technology. Enterprises could also use it for long-distance backbone connections in large campuses or for building out their own MANs where dark fiber is available for private purchase.

Objectives

- A Brief History of Ethernet
- 10-Gigabit Ethernet Overview
- Benefits of 10-Gigabit Ethernet
- Market Requirements
- Protocol Layer
- 10-Gigabit Ethernet MAC Layer
- MAC Frame Format
- and more...

Telecom Core Network

151 - ATM Fundamentals

Duration: 2 Day(s)

This course provides the concepts you need to understand Asynchronous Transfer Mode (ATM) in both practice and potential. This class lays the foundation for ATM by explaining all the basics from formats and headers to virtual circuits and connections. We also explore the evolution to an ATM network from a non-ATM network. You will gain a business perspective on how ATM compares with alternative technologies, review the many interfaces, and examine the protocol. In addition to an ATM overview, specific topics featured in this course include: congestion control, the adaptation layer, carrier services, ATM backbones, IP over ATM, voice and video over ATM, Private Network-to-Network Interface (PNNI), MPLS and ATM standard interfaces.

152 - VoIP Fundamentals

Duration: 2 Day(s)

Voice over IP (VoIP), which integrates voice and data transmission, is quickly becoming an important factor in network communications. It promises lower operational costs, greater flexibility, and a variety of enhanced applications. VoIP Fundamentals provides a thorough introduction to this new technology to help experts in both the data and telephone industries plan for the new networks. The hands-on labs are very useful methods to understand the A-Z of VoIP.

Objectives

After completing this course, students will be able to:

- Explain the basics of telephony and TCP/IP
- Understand the engineering tools and procedures required for a voice network and the current technologies leading to the integration of voice and data networks
- Explain the basics of Voice over IP (VoIP)
- Understand existing and emerging standards for VoIP and network architectures to support VoIP
- Understanding Carrier Grade VoIP Technologies
- Describe the protocols that support VoIP calls and explain how IP works with the PSTN
- Identify some of the challenges VoIP faces in today's networks to demonstrate a good understanding of its capabilities
- Explore the latest enabling technologies
- Explain Softswitch/MGC, Media Gateways, SIP, Megaco, and MGCP
- Voice characteristics, compression standa Mean Opinion Scores (MOS)
- Learn about the functional components involved in using gateways to deploy VoIP networks
- Explain the concepts of quality of service enforcement techniques
- Explain performance and voice quality considerations
- Discuss VoIP OSS/BSS
- Review transitioning to the All-VoIP PSTN and VoIP Taxation
- Explore project planning process of VoIP
- Review successful VoIP deployments for wireline, wireless, and cable operators
- Discuss successful and unsuccessful VoIP deployments
- Step through a practical process for managing a VoIP deployment project
- Explore the current and future market trends
- Discuss Video Services Over IP

Prerequisites: Basic understanding of telephony and TCP/IP is recommended.

For detailed information: www.tonex.com/Courses/150/152/

153 - SS7 Fundamentals

Duration: 2 Day(s)

The dramatic increase in Internet traffic is driving the need to standardize strategies for offloading data from the circuit-switched network and optimizing the performance of IP-centric next generation networks. The PSTN is expected to continue providing the vast majority of residential users with access to the Internet and other data services. SS7 Fundamentals provides a thorough introduction to SS7. Signaling System #7 Fundamentals training is the hands-down choice for engineers and network managers everywhere. It gives you a bedrock understanding of the signaling network, its architecture, and the protocols used to communicate through it.

Objectives

Upon completion of this course, the participant will have a through understanding of:

- SS7 (Signaling System 7) Network Architecture
- SS7 Protocol Stack
- Signaling Network Elements: SSPs, STPs and SCPs
- Signaling Network Structures
- SS7 Signal Units
- Signaling Links
- SS7 Protocols
- Message Transfer Part (MTP) Level 1-3
- SCCP, TCAP and ISUP
- SS7 in Mobile Networks
- MAP, CAMEL and CAP
- SS7 in Next-Generation Networks
- SS7 and VoIP
- SS7 Enabling Products
- SS7 Troubleshooting, Configuration and Testing Scenarios

Prerequisites: This is an introductory course with no prerequisites.

For detailed information: www.tonex.com/Courses/150/153/

154 - MPLS (Multi-Protocol Label Switching) Training

Duration: 2 Day(s)

MPLS stands for "Multiprotocol Label Switching". In an MPLS network, incoming packets are assigned a "label" by a "label edge router (LER)". Packets are forwarded along a "label switch path (LSP)" where each "label switch router (LSR)" makes forwarding decisions based solely on the contents of the label. At each hop, the LSR strips off the existing label and apply a new label which tells the next hop how to forward the packet.

Label Switch Paths (LSPs) are established by network operators for a variety of purposes, such as to guarantee a certain level of performance, to route around network congestion, or to create IP tunnels for network based virtual private networks. In many ways, LSPs are no different than circuit-switched paths in ATM or Frame Relay networks, except that they are not dependent on a particular Layer 2 technology.

An LSP can be established that crosses multiple Layer 2 transports such as ATM, Frame Relay or Ethernet. Thus, one of the true promises of MPLS is the ability to create end-to-end circuits, with specific performance characteristics, across any type of transport medium, eliminating the need for overlay networks or Layer 2 only control mechanisms.

Multi Protocol Label Switching (MPLS) is one of the central elements of next generation networks. It provides an IP-compatible, QoS-capable infrastructure that enables the convergence of voice, IP, ATM, Ethernet, and Frame Relay onto the same backbone network. MPLS can combine the intelligence and scalability of routing with the reliability and manageability of traditional carrier networks. It is the key to scalable virtual private networks (VPNs) and end-to-end quality of service (QoS).

TONEX MPLS course provides an in-depth study of MPLS technology, including MPLS theory and configuration, network design issues, case studies, operations, VPN, Traffic Engineering and GMPLS (Generalized MPLS).

Objectives

After successfully completing this course, attendees will:

- List the features, functions and benefits of MPLS
- Identify suitable applications for MPLS
- Describe the underlying concepts of MPLS
- Describe the frame-mode MPLS and cell-mode MPLS
- Describe the concept of MPLS labels, label stack and different label formats
- Describe the label distribution process between LSRs
- Describe the loop detection and prevention mechanisms in MPLS
- Explore the future trends of MPLS

Prerequisites: General understanding of data networking concepts is recommended

For detailed information: www.tonex.com/Courses/150/154/

155 - VPN Fundamentals

Duration: 2 Day(s)

A VPN is a communications environment in which access is controlled to permit peer connections only within a defined community of interest, and is constructed through some form of partitioning of a common underlying communications medium, where this underlying communications medium provides services to the network on a non-exclusive basis.

Virtual private networks have become an essential part of today's business networks, as they provide a cost-effective means of assuring private internal and external communications over the shared Internet infrastructure. Virtual Private Networks: Technologies and Solutions is a comprehensive, practical guide to VPNs.

VPN Fundamentals includes VPN concepts and architectures, an in-depth examination of advanced features and functions such as tunneling, authentication, access control, VPN gateways, VPN clients, and VPN network and service management.

This course presents the various technology components, concrete solutions, and best practices you need to deploy and manage a highly successful VPN.

Objectives

After completing this course, attendees will be able to:

- Understand IPsec, featuring the Authentication Header, Encapsulating Security Payload, Internet Key Exchange, and implementation details
- Understand PPTP, L2F, L2TP, and MPLS as VPN tunneling protocols
- Review Two-party and three-party authentication, including RADIUS and Kerberos
- Explore Public key infrastructure (PKI) concept and its integration into VPN solutions

- Understand Access control policies, mechanisms, and management, and their application to VPNs
- Review VPN gateway functions, including site-to-site intranet, remote access, and extranet
- Review Gateway configuration, provisioning, monitoring, and accounting
- Explore Gateway interaction with firewalls and routers
- Understand VPN client implementation issues, including interaction with operating systems
- Understand Client operation issues, including working with NAT, DNS, and link MTU limits
- Explore VPN service and network management architectures and tunnel and security management
- Review successful VPN deployments
- Discuss successful and unsuccessful VPN deployments
- Step through a practical process for managing a VPN deployment project
- Explore the current and future market trends

Prerequisites: Basic Knowledge of TCP/IP and Networkin

For detailed information: www.tonex.com/Courses/150/155/

Bss / Oss**203 - Network Operations and Maintenance (O&M)**

Duration: 3 Day(s)

For detailed information: www.tonex.com/Courses/200/203/**206 - SNMPv3 Fundamentals**

Duration: 2 Day(s)

This course introduces the fundamentals of network management, SNMP, SNMPv2, SNMPv3 and RMON 1, and RMON 2. It details the technology fundamentals of SNMP, SNMPv2, SNMPv3, and RMON 1 and 2 by explaining what's behind this family of popular networking standards.

Objectives

- After completing this course, the attendees will be able to:
- Specify the motivation for SNMPv3 protocol
- Discuss the status of SNMPv3, related standards and key players
- Sketch SNMPv3 architecture and components
- Discuss key features of SNMPv3 such as Authentication, Privacy Services and Access Control
- List key concepts and operations of SNMPv3
- Devise a strategy for deploying SNMPv3
- Examine the key differences between SNMPv1, 2 and 3 technologies

For detailed information: www.tonex.com/Courses/200/206/**207 - BSS/OSS Fundamentals**

Duration: 2 Day(s)

This course introduces the fundamentals of Business Support Systems (BSS) and Operation Support Systems (OSS), the information technology infrastructure that gives carriers and service providers the ability to create, deploy, manage, and maintain network-based services and applications. This course covers the details of BSS/OSS for current and next generation applications, services and networks.

Objectives

This course provides attendees with a comprehensive business and technical foundation in BSS and OSS . Upon completion of this course, the participants will:

- Understand what OSS and BSS are
- Explore OSS/BSS requirements for service providers
- Understand what different solutions can be used to enable service providers to maximize their profit, minimizing their costs and creating and managing their services and networks smoothly, and the benefits and limitations of each solution.
- Understand what automated and optimized end-to-end telco processes look like and how they could be implemented

Prerequisites: NoneFor detailed information: www.tonex.com/Courses/200/207/**212 - NGOSS/eTOM/SID Fundamentals**

Duration: 2 Day(s)

The TM Forum's four foundational frameworks include a Business Process Framework (eTOM), Information Framework (SID), Integration Framework (TNA), and Application Framework (TAM). They serve as the blueprint for a Service Oriented Enterprise by supporting the development and deployment of solutions that are easy to integrate, flexible, and easy to manage throughout their lifecycle.

TONEX training provides attendees with an introduction to the TeleManagement Forum's the New Generation Operations Systems and Software program (NGOSS), enhanced Telecom Operations Map (eTOM), Shared Information and Data Model (SID), Telecom Application Map (TAM), and Technology Neutral Architecture (TNA).

TONEX is a member of TM Forum.

Objectives

Upon completion, you will be able to:

- Understand TM Forum Strategic Direction
- Understand four NGOSS frameworks eTOM, SID, TAM and TNA, and the inherent relationship between them
- Understand NGOSS Business Process Map
- Understand how to utilize NGOSS frameworks
- The Service-Oriented Approach to System Design and Development of NGOSS
- Understand Enhanced Telecom Operations Map (eTOM)
- Understand Neutral Reference Points: internal process reengineering needs, partnerships, alliances, and general The Utilize NGOSS Information Model
- Explore Shared Information and Data Model (SID)
- Explore SID business-oriented perspective of the information and data
- Explore Enterprise Architecture modeling using the eTOM and SID
- Understand Integrating the eTOM and SID
- Explore eTOM and SID in real world projects UML Class Models
- Understand NGOSS TAM Business Application model to characterize the organizational application capability needs
- Understand NGOSS Architecture Guidelines
- Understand Technology Neutral Architecture (TNA) and Contract Interface
- Understand NGOSS Conformance Criteria
- Explore TONEX NGOSS-styled SOA methodology using SOA Service Contracts

Prerequisites: NoneFor detailed information: www.tonex.com/Courses/200/212/

213 - OSS/J Fundamentals

Cost: \$1999 | Duration: 3 Day(s)

For detailed information: www.tonex.com/Courses/200/213/**214 - Open Services Architecture (OSA)/Parlay Fundamentals**

Duration: 2 Day(s)

The OSA (Open Services Architecture) / Parlay APIs allow the Internet service model to be introduced into the telecom networks. Parlay is an open multi-vendor consortium formed to develop open technology independent APIs enabling ISVs, network device vendors, software developers, service providers, ASPs and enterprises to create applications that will run across multiple carrier networks.

This course provides an introduction to OSA/Parlay and related open network APIs. It introduces the drivers towards such APIs and their relationships, provides an overview of the API structure and functionalities, and explains the their realization in different network environments.

Parlay/OSA concept, market trends and requirements, who is using Parlay, what they are using Parlay for, and how it is deployed are discussed.

Objectives

- Open network Application Programming Interfaces (APIs) from
- 3GPP (OSA), Parlay and the Java APIs for integrated Networks (JAIN)
- What is Open Service Architecture (OSA)?
- What is Virtual Home Environment (VHE)?
- The OSA Applications
- The OSA Framework
- Service Capability Servers (SCSs)
- What is Parlay?
- What is JAIN?
- Telecommunication Information Networking Architecture (TINA) framework
- 3GPP Customized Applications for Mobile enhanced Logic (CAMEL)
- Parlay enabled business models
- What is the Parlay API?
- How does Parlay relate to other APIs (3GPP OSA, ETSI, JAIN)
- Enabling IT Middleware technologies (CORBA, Java, web services, etc.)
- Parlay relation to other standards (IN, CAMEL, OMA, etc.)
- Service Architectures - API Structure (Framework vs. Service Interfaces)
- Detailed explanation of the API (Framework Interfaces)
- Detailed explanation of the API (Service Interfaces)
- Parlay future roadmap Parlay players and products
- Parlay service examples
- Parlay deployment issues
- Migration to Parlay
- Parlay introduction strategies
- Reuse of Parlay on top emerging networks, such as 3GPP IMS
- Mapping of Parlay to the underlying network infrastructure (IN, CAMEL, 3GPP IMS)
- Comparison of Parlay to other specific service environments (CAMEL, SIP AS, etc.)

Prerequisites: NoneFor detailed information: www.tonex.com/Courses/200/214/**218 - Network Management and Operations Training**

Duration: 3 Day(s)

Network management refers to the activities, methods, procedures, and tools that pertain to the operation, administration, maintenance, and provisioning (OAM&P) of networked systems. In network management, functions such as security, monitoring, control, allocation, deployment, coordination and planning are executed. Network management is governed by a large number of protocols that exist for its support, including SNMP, CMIP, WBEM, Common Information Model, Java Management Extensions, Transaction Language 1, and Netconf.

Network management products can help enterprises and service providers to:

- Increase business and network resources
- Save network administrators time
- Improve business productivity
- Increase user satisfaction

This course introduces the fundamentals of network management and operations. It details the technology fundamentals of network OAM&P and network management architecture and protocols such as SNMP, WBEM and others. It explains what's behind this family of popular networking standards and procedures.

Objectives

Upon completing this course, the attendees will be able to:

- Specify the motivation for network management and operation
- Sketch network management architecture, protocols and components
- Examine OAM&P functions and procedures
- List all the FCAPS functions (Fault, Configuration, Accounting, Performance and Security)
- List key concepts and operations of SNMP and WBEM
- Devise a strategy for deploying network management
- Examine different network management protocols and standards
- Examine the key differences between TL-1, SNMPv1, 2 and 3 technologies, WBEM, XML, CORBA, JMX etc.
- Discuss key features of network management security as Authentication, Privacy Services and Access Control

Prerequisites: Basic understanding of networking and telecomFor detailed information: www.tonex.com/Courses/200/218/

401 - ATM Fundamentals

Duration: 2 Day(s)

This course provides the concepts you need to understand Asynchronous Transfer Mode (ATM) in both practice and potential. This class lays the foundation for ATM by explaining all the basics from formats and headers to virtual circuits and connections. We also explore the evolution to an ATM network from a non-ATM network. You will gain a business perspective on how ATM compares with alternative technologies, review the many interfaces, and examine the protocol. In addition to an ATM overview, specific topics featured in this course include: congestion control, the adaptation layer, carrier services, ATM backbones, IP over ATM, voice and video over ATM, Private Network-to-Network Interface (PNNI), MPLS and ATM standard interfaces.

For detailed information: www.tonex.com/Courses/400/401/

402 - SONET/SDH/DWDM Fundamentals

Duration: 2 Day(s)

This course provides an overview of the SONET/SDH and /DWDM networking elements, and their technologies, required to build evolving transport networks. It provides you with a comprehensive business and technical foundation in optical networks, services and applications development.

Objectives

Upon completion of this course, the attendees will be able to:

- Understand SONET/SDH Technology
- Understand SONET/SDH Transmission Hierarchy
- Explore SONET/SDH Architectures & Services
- Understand Digital Signal Synchronization
- Understand SONET/SDH Network Elements
- Develop SONET/SDH network architecture and configuration using Terminal Multiplex, Regenerator, Add/Drop Multiplexer (ADMs), Digital Cross-Connects and Digital Loop Carrier
- Understand Protection Switching

Prerequisites: This is an introductory course with no prerequisites.

For detailed information: www.tonex.com/Courses/400/402/

403 - Frame Relay Fundamentals

Duration: 2 Day(s)

This course provides an overview of the concepts and features of Frame Relay technology, applications and services. This course will give you a good understanding of the Frame Relay environment and how it fits into today's networking requirements.

Objectives

- Review basics of data communications to include the OSI-Open Systems Interconnect Layers.
- LAN/WAN technologies, internetworking; historical perspective of WAN networking solutions.
- Comparing frame relay to X.25.
- Why frame relay has been so successful
- The basic components of a frame relay network, describes benefits and limitations of the technology, and compares frame relay to other networking technologies in use today .Overview of the equipment it uses to provide services to customers, and Frame Relay interoperability with other protocols.
- and more ...

Prerequisites: A fundamental understanding of communications is preferred.

For detailed information: www.tonex.com/Courses/400/403/

412 - T1/T3 Fundamentals

Duration: 2 Day(s)

Understand how to select, integrate, and configure T1 and T3 services. Explore tariffs and service options before making a purchase decision, and learn about frame formats and how data is transmitted over T1/T3. Understand the marketplace and vendor choices. Master the fundamentals of T1, T3, and SONET.

Objectives

Understand fractional T1 applications, implementation and operation and evaluate T1 voice and data interface options, applications and performance criteria.

Prerequisites: None

For detailed information: www.tonex.com/Courses/400/412/

Policies & Regulations

801 - Telecommunication Regulation Fundamentals

Duration: 2 Day(s)

As in many other industries, regulators of the telecommunications industry have aimed to bring affordable products and services to the general public, while at the same time allowing participating companies to make adequate profits.

Over the last few years, there has been a step change in digital communications, which have had a dramatic effect on the way people live their lives and conduct business. Broadband technologies are becoming the base upon which people and IT systems are enabled to communicate electronically ubiquitously, rapidly and cheaply, resulting in a high level of innovation and a wide range of economic and social benefits.

Regulation is fundamental to the realization of the networked economy, as it plays a central role in setting a vision for the evolution of the telecoms market including, crucially, the types of market structure that will emerge. This is particularly the case with broadband telecoms, as first, in these early stages of deployment, the market needs structures that encourage the widest availability of cheap broadband as rapidly as possible, and second, market structures determine the extent of innovation within the telecoms industry itself, for example in applications and services, a key ingredient in achieving the networked economy.

As the EU and USA consider new regulatory approaches to electronic communications, this course explains what the new legislation means for the evolution of the telecoms industry, both now and in the future.

The course aims to question some aspects of conventional regulatory approaches, on the grounds that they risk losing some of the full benefits of the networked economy, and considers the big regulatory challenges that lie ahead. The course makes some important contributions in the area of our economic understanding of the empirical results global telecommunications markets.

Objectives

Upon completion of this course, the attendees will have a good understanding of:

- Telecom Act of 1996
- Role of ILECs/IXCs/Wireless Operators/Cable MSOs/CLECs
- Broadcasting and Cable Regulations
- Digital Terrestrial Television Regulations
- Interconnection Issues
- Internet Regulations
- Local Loop Unbundling Regulations
- VoIP Regulations
- What the economic benefits of the networked economy are
- What the regulators' role is in developing market structures that ensure the full benefits of broadband are delivered
- What the key aims of regulation in the networked economy are.
- How well suited new regulation in the EU and the USA is to supporting the necessary broadband market structures and to achieving innovation in infrastructure, services and applications
- What the new legislation mean for the longer-term development of the networked economy
- What issues will future regulatory reviews need to address

Prerequisites: None

For detailed information: www.tonex.com/Courses/800/801/

802 - International Telecommunication Regulation Fundamentals

Duration: 2 Day(s)

For detailed information: www.tonex.com/Courses/800/802/

806 - Telecommunications Deregulation Fundamentals

Duration: 2 Day(s)

This course provides a typology that maps social goals concerning marketplace activities to the regulatory interventions, if any, necessary to accomplish those goals, focusing on universal service policies. There is general agreement that, at a minimum, the fundamental goal of universal service in the United States is access for all Americans to basic analog voice-grade service at affordable rates.

Objectives

- Global telecom markets - Exploring new opportunities
- Recognize the importance of telecom deregulation in different part of the world
- How do service providers compete? What are the factors?
- Liberating the Internet
- Overview of Telecommunications Act of 1996
- Understand the role and globalization in the telecom domain
- Merger and Acquisitions (M&A) in telecom and more

Prerequisites: None

For detailed information: www.tonex.com/Courses/800/806/

9104 - Telecom Regulation, Tariff and Rate Training Workshop

Duration: 3 Day(s)

A 3-day Telecom Tariff and Rate Training workshop to provide participants with the basic concepts, methodologies and tools to gain an all-around understanding of telecom regulations, costs, tariffs and tasks and to ensure a fair, equitable telecom environment

Objectives

Upon completion of this course, the attendees

- Gain a sound understanding of the global and competitive telecommunications environment and its impact on the activities of a regulator
- Understand regulation and roles and responsibilities of the regulator
- Perform an in-depth review of competition policy and licensing concepts
- Present the role and responsibilities of the regulator related to interconnection and tariffs
- Understand numbering and spectrum management and the challenges it represents for the regulator
- Present the regulatory challenges and issues of Wireless, High-Speed Internet, Video, Multimedia, VoIP and Local Loop Unbundling
- Present the different dispute resolution mechanisms and the role of the regulator in settling disputes

For detailed information: www.tonex.com/Courses/800/9104/

Telecom Billing

2090 - Telecom Billing Fundamentals

Duration: 2 Day(s)

This course is the guide to telecommunications billing. The outline encompasses the entire end-to-end billing processes, with major focus on the interfaces with OSSs, BSS, network management, finance, marketing, pricing and customer support.

Objectives

- Overview of the modern telecommunications industry
- Industry trends in software, hardware and services
- Challenges facing new entrants
- How the perception of the billing system is changing
- Examples & illustrations of various types of call completion and how usage data is captured

Prerequisites: This is an introductory course with no prerequisites.

For detailed information: www.tonex.com/Courses/2000/2090/

2201 - Interconnect Billing Fundamentals

Duration: 2 Day(s)

The end of traditional monopolies and the explosive growth in the number of carriers means that Interconnect billing is beginning to supplant the old, inflexible and costly Accounting Rate System. For carriers new and old alike, Interconnect is a crucially important element of the revenue stream. This expert 2-day seminar gives a real insider's view of how to bill this, one of the fastest growing segments of the market.

- Grasp the principles of Interconnect and its billing
- Differentiate the various Interconnect billing models
- Identify the main Interconnect call scenarios

Prerequisites: None

For detailed information: www.tonex.com/Courses/2000/2201/

2202 - GPRS and UMTS Billing Fundamentals

Duration: 2 Day(s)

GPRS and UMTS IP-based billing is derived from Internet usage records (IURs), which are similar to the call detail records (CDRs) of circuit switched billing. The IUR utilizes fields and functions from the traditional CDR and extends it to monitor a broader range of parameters encompassing:

- Session length,
- Packet,
- Transaction,
- Service level, or
- CPU usage.

This course covers the fundamentals of IP billing applied to GPRS, EDGE and UMTS.

Objectives

Upon completion of this course, the attendees will have a good understanding of:

- GPRS, EDGE and UMTS billing and customer care
- GPRS, EDGE and UMTS billing process
- GPRS, EDGE and UMTS billing functions and architecture

- GPRS, EDGE and UMTS customer relationship management (CRM)
- GPRS, EDGE and UMTS Billing standards
- Exmple GPRS, EDGE and UMTS billing systems
- The future of GPRS, EDGE and UMTS billing and customer care

For detailed information: www.tonex.com/Courses/2000/2202/

2203 - Revenue Assurance Fundamentals

Duration: 3 Day(s)

We examine the root causes of billing errors and their potential impact. Tried and tested techniques are described for assessing current performance levels, setting appropriate performance targets, and managing the technology and business processes to achieve an optimal level of revenue assurance. The business case for implementing and maintaining a revenue assurance function is examined and examples of current regulation and the obligations placed on operators are described. In sessions, leaders will combine formal classroom presentation with case studies and attendee involvement through TONEX Roadmaps ®. Participants will walk away with a series of tangible mindset to immediately apply optimized Revenue Assurance implementation strategies.

Objectives

- To learn approaches to Revenue Assurance implementation including methodology and process
- To learn how to optimize end-to-end Revenue Assurance strategies
- To learn how to outwit fraud by subscribers and distributors
- To discover the importance of cost-effective product definition and service provisioning
- To understand how the mediation system can be helpful as a revenue assurance tool
- To understand the impact of copyright issues
- and more

Prerequisites: None

For detailed information: www.tonex.com/Courses/2000/2203/

2205 - Billing Mediation Fundamentals

Duration: 2 Day(s)

In a telecommunications network environment, various Network Elements like telephone switches encode and store accounting data, known as Call Detail Records (CDRs), in different formats. The mediation Platforms collect this data, converts it into a normalized output format, and then distributes it to third-party applications such as billing, traffic analysis, fraud management systems etc.

These platform enable service providers to tie in multiple types of network elements into a homogenous architecture. It can handle multiple switches with wide variety of network interface options. It is scalable, open, flexible and highly manageable and is available as a simple low-cost platform to high-end high-availability clustering platform.

This course is the guide to telecommunications billing mediation. The outline encompasses the entire billing mediation processes end-to-end, with major focus on the interfaces with OSSs, BSS, network management, and CRM.

Prerequisites: This is an introductory course with no prerequisites.

For detailed information: www.tonex.com/Courses/2000/2205/

2206 - Telecom Fraud Management

Duration: 2 Day(s)

Telecommunications fraud is one of the largest causes of revenue loss for service providers and it is estimated as a 200 billion USD annually. With the advent of new services such as 3G, 4G, VoIP, IPTV, gaming, content, and as telecom fraud becomes increasingly sophisticated, this problem will only become compounded.

To combat this, service providers will need advanced systems that can detect all types of fraud. Failure to do so may result in substantial revenue loss, and no operator can afford that today."

Objectives

"Telecommunications fraud is one of the largest causes of revenue loss for service providers," said Mr. Idelson. "With the advent of new services such as 2.5G, 3G and VoIP, and as telecom fraud becomes increasingly sophisticated, this problem will only become compounded. To combat this, service providers will need advanced systems that can detect all types of fraud. Failure to do so may result in substantial revenue loss, and no operator can afford that today."

Prerequisites: None

For detailed information: www.tonex.com/Courses/2000/2206/

Optical Networking

4010 - Synchronization Fundamentals

Duration: 2 Day(s)

Timing and synchronization are critical in converging IP and legacy SONET/SDH/ATM/TDM networks. This course provides a technical overview of the synchronization and introduces several key concepts in network synchronization.

In the Synchronization Fundamentals course, the underlying principles are reviewed along with common solutions and best practices. Our newly upgraded synchronization series includes examples, implementation and tradeoffs. Hours of real-life case studies are used to demonstrate key concepts. This course provides the rock-solid foundation of synchronization.

The course addresses the essential drivers of a synchronous network and the fundamental mechanisms and techniques that are invoked to understand, design, and operate a synchronous network. The "building blocks" of principles and best practices of synchronization in the telecom network are discussed in details.

Objectives

This course provides you with a comprehensive foundation in synchronization. After completing this course, students will be able to:

- Understand Synchronous Networks
- Review Fundamentals of Synchronization
- Understand Voice and Data Synchronization Needs
- Explore Synchronization Needs in Wireline and Wireless Networks
- Explore Convergence of Data and Voice Networks
- Describe Buffers, Slips, and Pointers
- Review Synchronous Aspects of SONET/SDH
- Review Synchronous Aspects of Asynchronous Transfer Mode (ATM) and VoIP

Prerequisites: Basic principles of SONET/SDH/ATM transmission systems.

For detailed information: www.tonex.com/Courses/4000/4010/

4011 - Wireline Synchronization

Duration: 1 Day(s)

Timing and synchronization are critical in the telecom networks such as PSTN, SONET/SDH, DWDM, ATM, and VoIP. This course provides a technical overview of the synchronization.

Objectives

This course provides you with a comprehensive foundation in wireline synchronization

Prerequisites: Course 4010 (Synchronization Fundamentals) or equivalent knowledge is recommended.

For detailed information: www.tonex.com/Courses/4000/4011/

4020 - SONET/SDH and DWDM Fundamentals

Duration: 2 Day(s)

This course provides an overview of the SONET/SDH and DWDM network architecture, networking elements and components, and technologies, required to build evolving transport networks. The course is presented at a level suitable for individuals comfortable with basic telecom and transport networks concepts who want to gain familiarity with all aspects of SONET/SDH and DWDM networks. The student will gain a good understanding of architecture, services and applications commonly deployed in SONET/SDH and DWDM networks. This course is completed with a view of current optical networking solutions.

Objectives

Upon completion of this course, the attendees will be able to:

- Understand SONET/SDH Technology
- Understand SONET/SDH Transmission Hierarchy
- Explore SONET/SDH Architectures & Services
- Understand Digital Signal Synchronization
- Understand SONET/SDH Network Elements
- Develop SONET/SDH network architecture and configuration using Terminal Multiplexer, Regenerator, Add/Drop Multiplexer (ADMs), Digital Cross-Connects and Digital Loop Carrier
- Understand Protection Switching
- Understand the basics of DWDM
- Explain basic DWDM Network Designs and Engineering
- Learn how to utilize different parameters in DWDM networks and optical systems

Prerequisites: This is an introductory course with no prerequisites.

For detailed information: www.tonex.com/Courses/4000/4020/

4021 - DWDM Fundamentals

Duration: 2 Day(s)

This course provides an overview of Dense Wavelength Division Multiplexing (DWDM).

Objectives

After completing this course, students will be able to:

- Understand the basics of optical communications
- Understand the basics of DWDM
- Explain basic DWDM Network Designs and Engineering
- Identify various optical communication principles as well as communication methodologies in an optical fiber
- Learn how to analyze optical links based on power budget
- Classify and design DWDM networks based on size and performance
- Understand and basic design nodal architectures for different classification of DWDM networks
- Learn how to utilize different parameters in DWDM networks and optical systems

For detailed information: www.tonex.com/Courses/4000/4021/

4030 - Advanced SONET/SDH

Duration: 2 Day(s)

This course provides advanced SONET/SDH and DWDM topics.

Objectives

This course provides you with a comprehensive technical details in SONET/SDH and DWDM. Upon completion of this course, the attendees will be able to:

- Understand Digital Voice and Plesiochronous Digital Hierarchy (PDH)
- Understand Transmission Hierarchies
- Understand Digital Network Synchronization
- Explore Benefits and Features of SONET/SDH
- Compare and Contrast STS-1 SPE and AU-3
- Understand Automatic Protection Switching (APS)
- Understand Add/Drop Multiplexers (ADMs)
- Understand Digital Cross-Connects (DCCs)
- Explore the evolution of Timing and Synchronization
- Understand SDH and Tributary Multiplexing

Prerequisites: SONET/SDH/DWDM Fundamentals is recommended

For detailed information: www.tonex.com/Courses/4000/4030/

4040 - Advanced DWDM

Duration: 2 Day(s)

This course provides an advanced technical overview of DWDM and optical networking concepts. One of the major issues in the networking industry today is tremendous demand for more and more bandwidth. With the development of optical networks and the use of Dense Wavelength Division Multiplexing (DWDM) technology, a new and probably, a very crucial milestone is being reached in network evolution.

In this course we will discuss various advanced concepts that are integral to the development of the All-Optical Network. Various new technologies available in a DWDM system will be introduced. Issues such as Network Design, Network Control and Network Management will also be discussed.

Objectives

After completing this course, students will be able to:

- Understand advanced optical communications topics
- Explain advanced DWDM Network Designs and Engineering
- Design and evaluate optical components in a DWDM network
- Learn about the effects of noise in signal propagation, especially from OSNR and BER perspectives
- Design optical amplifier-based links
- Learn how to design optical links based on power budget, dispersion and non-linearities
- Design optical links based on OSNR
- Classify and design DWDM networks based on size and performance
- Learn how to test and measure different parameters in DWDM networks and optical systems

Prerequisites: This is an advanced program covering all the details of DWDM components and networks. Course 402, 404 or similar courses are recommended.

For detailed information: www.tonex.com/Courses/4000/4040/

4050 - Optical Networking Fundamentals

Duration: 2 Day(s)

This course provides a technical overview of optical networking. It gives students a solid understanding of optical networking field principles and practice.

Underlying principles are reviewed along with common optical solutions and practices. Our newly upgraded Optical Networking Series includes Examples, Implementation and Trade-offs. It explains and provides practical tips on how to design and implement Networks for Optimum Performance. Hours of Real-life case studies are used to demonstrate key concepts. The optical networking seminar provides the Rock-Solid foundation of optical systems. We present and explain SONET/SDH and DWDM implementation.

Objectives

This course provides you with a comprehensive business and technical foundation in optical networking and its services and applications development.

Prerequisites: This is an introductory course. Students are expected to be familiar with basic principles of transmission systems.

For detailed information: www.tonex.com/Courses/4000/4050/

Strategy & Management

800: Introduction to Global Telecom Business Trends and Analysis

Duration: 2 Day(s)

The course provides global strategic analysis of key regulatory, technical, and financial trends impacting the established and new entrant service providers. It analyzes the technology trends underlying many of strategies and the principles the executives are applying as they attempt to build new businesses. A hands-on, applications-based workshop for analytically oriented planners and managers. Drawing heavily on examples and recent forecasts from the telecom industry, this seminar provides the participant with an excellent overview of trends in the telecom industry.

Objectives

Telecom Business Trends and Analysis graduates understand:

- Business & Technology Strategy Analysis in Communications
- Emerging Telecom Markets and Technologies for Multimedia, Data and Voice (including both wireline and wireless)
- A broad perspective on changes affecting all aspects of telecommunications
- Service Portfolio and Strategy
- Sustainable Competitive Advantages
- Near-Term and Long-Term Vulnerabilities
- Core Business Strategy and Key Alliances
- Business and Operation Support Systems (OSS/BSS)
- Telecom Business Processes Global Outsourcing
- Role of Executives, Financial Standing, Core Technologies,