Telecom Courseware Library
Catalog
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What's New
Introduction to Project Management

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Telecom Basics Series

- 5 courseware modules that introduce a range of modern telecommunications and datacommunications topics
- 2 pdf eBooks (each 150+ pages) - can be used to support the courseware, or as standalone reference texts

Introduction to Datacommunications

Target Audience :

Sales/management personnel , technical staff from other disciplines, 3rd level engineering and computing students, engineering staff, field and maintenance engineers

Key Content :

- Introduction
- Basic concepts
- Protocol stacks
- LAN/WAN
- TCP/IPv4
- IPv6
- Datalink
- ATM, MPLS
- Mobile
- Regulatory/Business
- Real-time
- Convergence
- Frame relay
- DSL
- Bandwith

Introduction to Telecommunications

Target Audience :

Sales/management personnel , technical staff from other disciplines, 3rd level engineering and computing students, engineering staff, field and maintenance engineers

Key Content :

- Introduction
- Basic concepts
- PCM & voice coding
- Multiplexing
- Transmission
- Switching
- Traffic engineering
- Signaling
- Billing
- Cellular
- Packet-based
- Broadband
- VoIP
- Cable
- Regulatory

Introduction to Wireless

Target Audience :

Sales/management personnel , technical staff from other disciplines, 3rd level engineering and computing students, engineering staff, field and maintenance engineers

Key Content :

- Introduction
- Basic concepts
- Modulation
- Multiple access
- Cellular - GSM, CDMA
- Fading
- Countermeasures
- Fixed Wireless
- Frequency planning
- Antennae
- Duplex/Simplex
- Power budgets
- Cell planning
- Signal loss
- Satellite

Introduction to Mobile Data & Applications

Target Audience :

Sales/management personnel , technical staff from other disciplines, 3rd level engineering and computing students and recent computer science & engi

Key Content :

- Introduction
- Basic concepts
- Protocol stacks
- LAN/WAN
- TCP/IPv4
- IPv6
- Datalink
- ATM, MPLS
- Mobile
- Regulatory/Business
- Real-time
- Convergence
- Frame relay
- DSL
- Bandwith

Introduction to Digital Broadcasting

Target Audience :

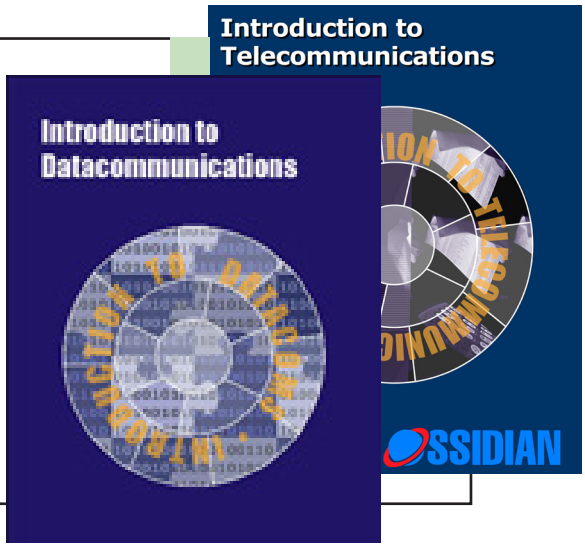
Sales/management personnel , technical staff from other disciplines, 3rd level engineering and computing students and recent computer science & engi

Key Content :

- Introduction
- Basic concepts
- Protocol stacks
- LAN/WAN
- TCP/IPv4
- IPv6
- Datalink
- ATM, MPLS
- Mobile
- Regulatory/Business
- Real-time
- Convergence
- Frame relay
- DSL
- Bandwith

eBooks

- Two 150+page pdf eBooks
- Distribute them electronically. End-users can print them on demand
- Use them as standalone references, or to supplement the courseware.
- in-depth coverage of modern datacom and telecom technologies from a business perspective



2G Cellular Series

GSM Fundamentals

Comprehensive overview of the Global System for Mobile Communications (GSM), which is the most widely used second-generation (2G) system in the world.

- identify the principal objectives in the implementation of GSM
- identify the services and network structure of GSM
- list the components of the GSM Reference Model
- describe the MS, BSC, BTS, MSC, HLR, VLR, EIR, AuC and OSS
- define GSM's registration, location updating, paging, and security processes
- outline the main stages in a PSTN to MS call (including MS roaming)

GSM Air Interface

Comprehensive overview of the use of physical and transport channels on the Air Interface.

- identify the challenges presented by GSM's transmission environment
- identify the solutions devised for GSM's transmission challenges
- outline the main stages of GSM's transmission processes
- describe the physical and transport channels on the GSM Air Interface
- identify GSM's security management system

GSM Signaling and Protocols Architecture

Comprehensive overview of the role of signaling in GSM, and considers in detail the GSM sub-system entities and signaling protocol architecture.

- define the role of signaling in GSM
- identify the protocols used in GSM signaling
- describe the GSM interfaces
- describe the GSM subsystem entities
- describe the GSM's protocol architecture

GSM Signaling and Protocols Procedures

Practical application of signaling systems and protocols. This module describes signaling, synchronization, location update, handover, security procedures, and call scenarios.

- describe GSM's location update procedure, from initiation to conclusion
- identify the purpose of GSM's security procedures
- describe the role of signaling in GSM's security procedures
- describe the placing of an MS-to-PSTN call from a GSM PLMN
- describe the placing of a PSTN-to-MS call
- describe the placing of an MS-to-MS within a GSM PLMN
- describe GSM's Intra-MSC handover and Inter-MSC handover processes

cdmaOne Fundamentals

Comprehensive overview of cdmaOne standards and IS-95 in particular. The Code Division Multiple Access (CDMA) technique, which is used in cdmaOne cellular systems, is also described.

- Define Code Division Multiple Access (CDMA)
- Outline the origins of the cdmaOne cdmaOneTM TM standards family
- Outline a number of spread spectrum techniques
- Describe the main benefits of CDMA and its performance
- Understand the cdmaOneTM IS-95 standard
- Outline briefly how voice coding and power control is defined
- Describe the forward and reverse channels
- Outline the access procedure and handoff in a CDMA system

2.5G Cellular Series

GPRS Fundamentals

Comprehensive overview of GPRS, and the motivation behind GPRS, modifications of standard GSM systems required by GPRS, and future implications of GPRS.

- list the processes used for circuit-switched data within GSM
- list the advantages of moving to a packet-switched standard
- identify the key components of a GPRS network
- explain the process of attaching a user to a GPRS network
- explain the process of sending a data packet across the GPRS network

GPRS Engineering

Comprehensive overview of call handling and the air interface of a GPRS network.

- GPRS channel types (including their mapping onto GSM channels), the multi-frame structure, and the channel coding process
- sending data from a mobile station to a GPRS server
- identify advantages of GPRS
- key elements of the GPRS network
- map GPRS network onto GSM network
- distinguish between various GPRS channel types
- map GPRS channels onto GSM channels
- define GPRS multi-frame structure
- identify the process of sending data from a mobile client to a GPRS server

3G Cellular Series

All-IP 3G Fundamentals

All-IP and convergence is set in context by this overviews of 3G and Internet systems and their evolution.

- Explain the rationale and the limitations of IP in 3G
- Outline the business case for All-IP 3G
- Appreciate the application of some advanced services
- Understand the context and technologies of both IP and 3G
- Identify the features and challenges involved in All-IP 3G
- Describe the evolution of standards towards All-IP 3G

All-IP 3G Technology

Technical overview of All-IP 3G systems. It emphasizes the IP Multimedia Subsystem (IMS)-the main enabler of convergence

- Define All-IP-3G technology
- Understand the role of the IP Multimedia Subsystem
- Identify the main IMS features
- Explain the operation of the architecture elements
- Describe the functions of the main reference points
- Outline the procedures, protocols and supporting functions

CDMA2000 1XRTT Fundamentals

Comprehensive overview of 1xRTT technology. The context within different generations and technologies is outlined. The systems, operations, channels and network are described, and compared with earlier cdmaOne cdmaOne.

- Understand the CDMA2000 1xRTT historical and technical context
- Outline some new features relative to cdmaOne cdmaOneTM TM
- Describe the network components and operation
- Explain some issues in data transport
- Understand the radio aspects
- Describe the channel structures
- Explain the access and mobility techniques
- Identify the differences between 1xRTT, 1xEVolution and 3X

CDMA 2000 1xRTT EVolution

Comprehensive overview of the evolution of CDMA2000 1xRTT standard. The two main systems, 1xEV-DO (Data Only (or Optimized)) and 1xEV-DV (Data & Voice) are discussed.

- Appreciate the historical and technical context of CDMA2000 1xEV
- Understand both the 1xEV-DO and 1xEV-DV air interfaces
- Identify the key technical features of 1xEV-DO and 1xEV-DV
- Describe the channel structures
- Understand the operation of the different protocol layers

EDGE Fundamentals

Comprehensive overview of the rationale, technology, context and evolution of Enhanced Data Rates for Global Evolution (EDGE).

- outline the rationale and history of EDGE
- understand its context within 2G and 3G
- explain the overall EDGE concept
- understand specific technical features
- describe the standards
- outline cell planning implications
- identify some technology evolution paths

continued

HSDPA Fundamentals

High-Speed Downlink Packet Access (HSDPA) is a performance upgrade to the UMTS/WCDMA downlink air- airinterface, for packet access. This module provides a comprehensive overview of HSDPA background and technology.

- define HSDPA
- understand the existing UMTS air- airinterface
- interface
- explain the HSDPA features and
- operation
- describe the function of the different
- channels
- understand HSUPA
- outline some later enhanced features

UMTS R7 Fundamentals

High-level introduction to Release 7 of UMTS. This module deals with international development and standardization

- identify services and applications offered by 3G UMTS systems
- outline the standardization process for 3G UMTS to Release 7
- list the 3G UMTS frequency spectrum allocation
- describe the key features of the UMTS / WCDMA / HSDPA air interface
- outline the system architecture for 3G UMTS / All-IP 3G IMS networks
- describe the evolutionary scenarios for deploying 3G UMTS systems

UMTS Air Interface

Examines the technical detail of the air interface used on UMTS, known as WCDMA.

- describe WCDMA frequency allocation
- identify the protocol layers of the radio interface
- identify the different transport channels used in WCDMA
- list WCDMA's uplink and downlink physical channels
- outline the modulation and spreading used in WCDMA
- identify WCDMA's transport channel coding and multiplexing schemes
- describe how handover is performed in WCDMA
- identify the performance enhancement features used for the WCDMA

UMTS End--to-end Scenarios

This module focuses on UMTS signalling in various call scenarios including mobile-originated and mobile-terminated circuit-switched calls, and mobile-originated and mobile- mobileterminated packet service requests.

- Mobile Originated Circuit-Switched Call
- Mobile Originated Packet Service Request
- Mobile Terminated Circuit-Switched Call
- Network Originated Packet Service Request
- Intra-UTRAN Handover
- UMTS to GSM Roaming
- GSM to UMTS Roaming
- UMTS SMS Protocol Architecture
- UMTS SMS Message Flows
- UMTS Location Reporting

UMTS Signaling Framework

Considers signaling and protocol specifications for UMTS prepared by the 3GPP Standardization fora.

- Overview of UMTS Service Capabilities
- UMTS and GSM/GPRS Interworking
- UMTS Functional Architecture (I)
- UMTS Functional Architecture (II)
- UMTS Signaling Architecture
- UMTS Signaling Protocol Layers
- UMTS Iu Reference Point and Interfaces
- UMTS QoS Requirements
- UMTS CAMEL/VoIP Requirements
- UMTS Security Requirements & Procedures
- UMTS Handover Requirements
- UMTS Short Message ServiceLayers

continued

UMTS Signaling Procedures

Considers practical application of the signalling systems and protocols described in UMTS Signaling Framework.

- synchronization processes in UTRAN and protocol stack
- UMTS signalling
- Network and Terminal States
- UMTS Attach Procedure
- Serving RNS Relocation Procedure
- Combined Cell/URA Update & Serving RNS Relocation Procedure
- Routing Area Update Procedure
- UMTS Detach Procedure
- UMTS Security – MS Identification
- UMTS Security - Authentication and Ciphering
- UMTS Paging Procedure

Fixed Wireless Series

802.11 Fundamentals

Comprehensive introduction to the 802.11 Wireless LAN standard.

- Introduction to Wireless LANs
- 802.11 Overview
- MAC Layer
- MAC Frame Structure
- Physical Layer Overview
- Base Standard Physical Layers
- Rate Extension PHY Standards
- Roaming and TCP/IP in 802.11
- Software and Hardware Implementation Issues
- Security and Other Developments
- QoS & Regulatory Standards
- Post-2005 Work
- 802.11n

WiMAX Fundamentals

The module defines WiMAX and positions it within the overall telecom sector. It identifies key market applications, implications and benefits.

- Define WiMAX and its role
- Position WiMAX standards within the overall telecom sector
- Identify key applications, implications and benefits
- Outline the different IEEE 802.16 specifications
- Describe the main technical features
- Understand the operation of the protocol layers
- Compare WiMAX with similar standards and discuss the relationships

WLAN Fundamentals

Provides a comprehensive overview of Wireless LAN systems and standards, mainly 802.11 and HiperLAN/2.

- Introduction to Wireless LANs
- Public Access WLAN Market
- Wireless Networks
- Components and Systems
- 802.11 Standard
- 802.11 MAC and PHY Layers
- HiperLAN/2
- WLAN / 3G Interworking
- WLAN Security and Deployment
- Sky-based Applications and Technology Trends

Signaling Series

SS7 Fundamentals

Covers SS7 signaling which is a vital part of modern wireline and wireless telephone networks. Next-generation networks and services will depend upon its operation in the packet world and its evolution.

- Introduction
- Overview of SS7
- SS7 Protocol stack
- Message Transfer Part (MTP)
- Telephone User Part (TUP)
- ISDN User Part (ISUP)
- Broadband ISDN User Part (BISUP)
- Signaling Connection Control Part (SCCP)
- Transaction Capabilities Control Part (TCAP)
- Mobile Application Part (MAP) and GSM
- IP - SIGTRAN

SIGTRAN Fundamentals

Covers the the SIGTRAN suite of signaling protocols that use Internet Protocol (IP) links to connect SS7 and ISDN signalling nodes.

- Motivation and Context
- The SIGTRAN Concept
- SCTP Introduction
- SCTP Behaviour
- M2PA (MTP2 Peer-to-peer Adaptation Layer)
- M2UA (MTP2 User Adaptation Layer)
- M3UA (MTP3 User Adaptation Layer)
- SUA (SCCP User Adaptation Layer)
- Other User Adaptation Layers
- Implementing SIGTRAN
- Applications of SIGTRAN

Protocols Series

ATM Fundamentals I

Considers Asynchronous Transfer Mode (ATM) network, the switching mechanisms used by the network, and ATM cells.

- define Asynchronous Transfer Mode (ATM)
- outline the history and origins of ATM
- describe ATM network services
- distinguish between virtual channels and virtual paths
- describe the different network nodes and their interfaces
- outline the components of an ATM cell
- describe the Cell Relay process
- outline the Protocol Reference Model

ATM Fundamentals 2

Examines the ATM protocol stack, signalling, Quality of Service, and Network Management.

- ATM Transport Network
- ATM Adaptation Layer (AAL)
- ATM Service Classifications
- AAL Protocols
- ATM Layer
- ATM Physical Layer
- ATM Physical Layer: Examples
- ATM Signaling
- ATM UNI Signaling
- Signaling ATM Adaptation Layer
- ATM Quality of Service
- ATM Traffic Management
- ATM and Error Handling
- ATM Network Management
- Summary & Conclusions

Introduction to VoIP

Comprehensive overview of the Voice over Internet Protocol (VoIP).

- general convergence of voice and data networks, features and challenges.
- architectures, devices and protocols,
- security issues and solutions.
- Introduction and Overview
- Network Convergence
- VoIP Features and Challenges
- QoS Protocols
- H.323
- Gateways
- Gateway Protocols
- Session Initiation Protocol
- Case Examples and Security

IPv6 Fundamentals

Comprehensive overview of IPv6, the latest level of the Internet Protocol Protocol. The module considers the development of IPv6 as a consequence of the shortcomings of IPv4

- The End of the Road for IPv4
- History of IPv6
- Key Features of IPv6
- Structure of IPv6 PDU
- IPv6 Header
- IPv6 Addressing Overview
- Unicast Addresses – I
- Unicast Addresses - II
- Multicast Addresses
- Anycast Addresses
- Summary

IPv6 Advanced

Following on from IPv6 Fundamentals, IPv6 Advanced considers IPv6 in detail including optional header extensions, security issues, traffic types and flow.

- Introduction
- Hop-by-hop Options header
- Routing header
- Fragment Header
- Destination Options Header
- Security Issues
- Authentication Headers
- Encapsulated Security Payload
- Neighbour Discovery
- Address Autoconfiguration
- Transition Mechanisms
- Summary

continued

SIP Fundamentals

Provides a comprehensive overview of Session Initiation Protocol (SIP), its applications, and related systems.

- Introduction and Overview
- VoIP and SIP
- SIP Background and Principles
- Architecture
- Message Format
- Structure and Processes
- Session-Invitation Scenario
- Session-Proper Scenario
- Inter-working with PSTN ISUP
- IP-3G IMS Application

WAP Fundamentals

Provides a high-level introduction to Wireless Application Protocol (WAP), in particular the standards and regulations that provide a framework for application development on wireless networks.

- define 'WAP'
- outline the history and origins of WAP
- identify the standards involved in WAP
- describe the WAP Programming Model, including the WAE and WTA
- outline the components of the WAP stack
- identify the different WAP bearers
- list a variety of WAP applications, products, and development toolkits

MPLS Fundamentals

Explains Multiprotocol Label Switching (MPLS) which was conceived as a solution to two key problems with Internet Protocol - the clear need for faster packet forwarding, and competing demands for priority and quality.

- Introduction and Background
- Labels and label switching
- Signaling and traffic control
- Traffic engineering
- MPLS and wireless
- MPLS security
- Benefits of MPLS
- Case study #1 – VPN
- Case study #2 – VoIP
- Case study #3 – Traffic engineering
- GMPLS

Satellite Series

ATM over Satellite 1

Comprehensive overview of the use of ATM transport for satellite. The components of a satellite communications system are described and the different standards organizations. The module also considers key issues in using ATM over satellite, including error rates and propagation delays.

- Motivation for ATM over Satellite
- Working Bodies
- Error Correction
- Propagation
- Outages
- Architecture of ATM Satellite Systems
- Onboard Processing Satellite
- Summary & Conclusions

ATM over Satellite 2

Further detail on the ATM over satellite systems introduced in ATM over Satellite Module 1. In particular, the module examines satellite access and Quality of Service issues, multiplexing in onboard processing satellite systems, error coding schemes, and antenna systems.

- Review of ATM over Satellite Module 1
- Media Access Control (MAC) protocols
- Satellite Access and Quality of Service (QoS)
- Satellite Access: Example
- Multiplexing
- Error Coding
- Onboard Antennas
- Satellite Networks and ATM
- ATM over Satellite Projects
- Conclusions

Satellite Rating & Billing Fundamentals

Comprehensive overview of rating and billing procedures for satellite telecommunications service providers.

- Introduction to Satellite Billing
- Wireless Telecommunications
- MSS Components and Infrastructure
- Satellite Network Structure
- Satellite Numbering Plans
- RoamingMSS Event Detail Records
- Billing Periods and Cycles
- Charge Types, Pricing, and Prepaid
- Service
- Rating of Events
- Bill Processing Steps
- Billing Media
- Interconnect Accounting

Digital TV Series

DVB-S Fundamentals

Concentrates on the satellite aspects of digital broadcasting. Identify the major components of satellite broadcasting

- Appreciate the role of the DVB Project
- Understand the technical issues involved
- Describe the MPEG coding techniques
- Understand the operation of geo-stationary satellites
- Appreciate some link engineering issues
- Understand various transmission issues involved
- Describe the operation of satellite TV reception
- Understand the DVB-S standard
- Understand DVB Service Information
- Describe other relevant DVB systems and standards

Telecom Operations Series

Customer Care

Comprehensive overview of customer care principles and procedures relevant to the telecommunications industry.

- Introduction to Telecommunications Customer Care
- Introduction to Customer Relationship Management
- Customer-Telco Contact Cycle
- Managing Service Prospects
- Account Set-up
- Selling Services
- Service Provisioning
- Account Hierarchies
- Credit Management
- Invoicing
- Payment Types
- Payment Processing
- Payment Review
- Delinquent Accounts

Revenue Assurance

Comprehensive overview of revenue assurance principles and procedures relevant to the telecommunications industry.

- Telecommunications Revenue Assurance
- Billing Integrity
- Managing Account and Usage Fraud
- Controlling Bad Debt
- Account Analysis
- Managing Credit
- Managing Collection Activities
- Managing Customer Churn
- Writing Off Bad Debt
- Customer Service and Revenue
- Assurance
- Billing Systems

Wireless Rating & Billing Fundamentals

Comprehensive overview of rating and billing procedures for wireless telecommunications service providers.

- Introduction to Wireless Rating and Billing
- Wireless Technologies
- Wireless Components and Infrastructure
- Wireless Network Structure
- Wireless Numbering Plans
- Roaming
- Wireless Event Detail Records (EDRs)
- Billing Cycles
- Charge Types, Pricing, and Prepaid Service
- Rating of Events
- Bill Processing
- Billing Media
- Interconnect Accounting

Wireless Rating & Billing Advanced

Extends consideration of rating/billing business processes.

- Introduction to Telecommunications Event Processing and Rating
- Event Processing Steps
- Consolidation of Event and Billing Information
- Event Detail Record Validation
- Rating of an Event
- Account Discounts
- Non-Event Charges
- Payment and Adjustment Information in Event Processing
- Calculation of Finance and Penalty Charges
- Application of Taxes and Tariffs
- Invoice Structure and Generation of the Invoice
- Revenue Assurance in Event Processing

Setting Tariffs for IP Services

Examines tariffing ('rating') for IP services, and for new telephony services delivered over an IP framework.

- Impact of IP Services on the telecommunications industry
- North American model for IP tariffing
- European model for IP tariffing
- Asian model for IP tariffing
- Usage based IP tariffing defined
- Variations on Usage based IP tariffing
- Issues with Usage based IP tariffing
- Flat rate IP tariffing defined
- Flat rate tariffing for VoIP Networks
- xDSL tariffing
- Marketing packaged tariffs
- Packaged IP tariffs for Residential
- Customers

continued

Introduction to Project Management

Basic introduction to project disciplines and project management. Especially helpful for people coming to projects for the first time.

- Concept of a project
- Introduction to project lifecycle
- The importance of planning
- Estimating
- How to develop project schedules and allocate resources
- Dealing with out-sourced activities
- Key project issues
- Personnel issues
- Process issues
- Product & technology issues
- Project controls and communications
- Introduction to formal methodologies - including Waterfall, PRINCE/2, SDLC, RUP, RAD

Pre-publication announcements

Ossidian intends to publish additional titles during 2009 to reflect trends in mobile telecommunications technologies. These titles shall not be part of the existing library - they shall be incorporated into a new library and subject to separate licensing prices and commercial terms. Likely titles include series covering :-

LTE

Long-term evolution (LTE) of UMTS will result in the implementation of new networks within the next 4 years. This series will cover the core network architecture, radio access network, signaling and architecture of UMTS Release 8.

Mobile WiMAX

This promises to be a key alternate technology to LTE, offering mobile users access to very high-speed IP.