

Foundation in Telecommunications

COURSE DESCRIPTION

The Foundation in Telecommunications course provides a comprehensive introduction to modern telecommunications technologies and how they work together to deliver voice, data, video and messaging services across fixed and wireless networks.

Participants will explore how networks have evolved from traditional circuit-switched copper systems to modern packet-based fibre and mobile infrastructures. The course covers key technologies including fibre optics, Ethernet, TCP/IP, mobile networks and transport systems, giving participants a clear understanding of how today's telecommunications networks operate.

No prior experience is required, making this course ideal for those new to the telecommunications industry or transitioning into technical roles.

WHO SHOULD ATTEND

Individuals looking to gain a foundational understanding of telecommunications technologies, including those new to the industry or working in roles that require a general understanding of network infrastructure and services.

PREREQUISITES

No previous experience is required. This is a foundation-level course.

SOME COURSE BENEFITS

- Understanding of key telecommunications technologies and terminology
- Clear view of how different network technologies interconnect
- Knowledge of modern network architectures and applications
- Improved confidence discussing telecommunications with customers and colleagues
- Strong foundation for further technical training

+61 3 9381 7888

INFO@COVERTEL.COM.AU

114 BAKEHOUSE ROAD, KENSINGTON VIC 3031
AUSTRALIA

PO BOX 553, NORTH MELBOURNE, VIC 3051
AUSTRALIA

WWW.COVERTEL.COM.AU



COURSE OBJECTIVES

Participants will gain the knowledge and skills required to:

- Understand core telecommunications concepts and terminology
- Explain how voice, data and video are transmitted across networks
- Identify key technologies used in fixed and wireless networks
- Understand how modern networks are structured and operate
- Recognise the evolution from legacy to modern telecommunications systems

FORMAT

4.5-day interactive classroom training including theory sessions, practical exercises and group discussions.

Maximum attendees: 10 per course.

CONTENT

Day 1 – Telecommunications Fundamentals

The Big Picture

- Telecommunications terminology and key concepts
- Analogue and digital communications
- Encoding methods
- Voice, data and media formats (PCM, ASCII, MP3, JPEG, MPEG)
- Real-time vs non-real-time applications

Network Fundamentals

- Circuit switching vs packet switching
- Transmission mediums (copper, fibre, wireless)
- Legacy networks (PSTN, ISDN, xDSL)
- Fibre broadband (GPON)
- LAN and WAN networks
- OSI model and IP stack overview

Modern Network Technologies

+61 3 9381 7888

INFO@COVERTEL.COM.AU

114 BAKEHOUSE ROAD, KENSINGTON VIC 3031
AUSTRALIA

PO BOX 553, NORTH MELBOURNE, VIC 3051
AUSTRALIA

WWW.COVERTEL.COM.AU



- Fibre optic advantages and overview
- Multiplexing concepts
- Mobile network evolution (1G–5G)
- Wi-Fi (802.11)
- Internet and TCP/IP fundamentals
- Quality of Service (QoS) and Class of Service (CoS)
- VPNs and SD-WAN
- Voice over IP (VoIP) and SIP

Day 2 - Layer 1 Fibre Optics

Fibre Optic Fundamentals

- Principles of light
- Fibre optic systems
- Fibre safety
- Singlemode and multimode fibres
- Fibre construction and components
- Connectors and colour codes
- Fibre cables and air blown fibre

Optical Transmission

- LEDs and lasers
- Fibre receivers
- Attenuation and dispersion
- Wavelength multiplexing (CWDM, DWDM, ROADMs)
- Fibre broadband networks (FTTX, GPON)

Practical Exercises

- Fibre inspection and cleaning
- Cable preparation
- Fusion splicing

Fibre Testing

+61 3 9381 7888

INFO@COVERTEL.COM.AU

114 BAKEHOUSE ROAD, KENSINGTON VIC 3031
AUSTRALIA

PO BOX 553, NORTH MELBOURNE, VIC 3051
AUSTRALIA

WWW.COVERTEL.COM.AU



Testing theory
Inspection probes
Visible fault locators
Live fibre identifiers
Light source and power meter
OTDR overview

Day 3 – Layer 2: Ethernet & Carrier Ethernet

Ethernet Fundamentals

- LAN architecture and components
- Ethernet speeds and cabling
- Switching and network devices

Ethernet Technologies

- Ethernet framing (DIX, 802.3)
- MAC addressing
- VLANs and tagging (802.1Q)
- QoS and CoS (802.1p)


Traffic Management & Testing

- Metro Ethernet
- Ethernet virtual circuits (EVC)
- E-Line and E-LAN services
- VLAN stacking (Q-in-Q, MAC-in-MAC)

Day 4 - Layer 3: TCP/IP & Converged Networks

IP Networking

- TCP/IP protocol stack
- IP addressing (IPv4 and IPv6)
- Subnetting fundamentals

+61 3 9381 7888 

INFO@COVERTEL.COM.AU 

114 BAKEHOUSE ROAD, KENSINGTON VIC 3031
AUSTRALIA 

PO BOX 553, NORTH MELBOURNE, VIC 3051
AUSTRALIA 

WWW.COVERTEL.COM.AU 

- DNS, DHCP and ICMP

Transport Protocols

- TCP and UDP
- Ports and application performance

Routing & Applications

- Routing protocols (BGP, OSPF, IS-IS)
- Routing vs switching
- Voice over IP (VoIP)
- SIP signalling
- Performance issues (latency, jitter, packet loss)

MPLS Overview

- MPLS concepts and operation
- Label switching
- Label distribution

Day 5 – Transport Networks (Half Day)


Transport Technologies

- PDH and SDH overview
- Network synchronisation and timing
- STM framing and hierarchy
- Ethernet over SDH


Optical Transport Networks (OTN)

- OTN architecture and standards
- OTN layers (ODU, OTU, OPU)
- Forward Error Correction (FEC)

WDM & Modern Transport

+61 3 9381 7888 

INFO@COVERTEL.COM.AU 

114 BAKEHOUSE ROAD, KENSINGTON VIC 3031
AUSTRALIA 


PO BOX 553, NORTH MELBOURNE, VIC 3051
AUSTRALIA 

WWW.COVERTEL.COM.AU 

- WDM fundamentals
- Optical spectrum (C and L bands)
- Channel spacing and evolution

Assessment

- Instructor-led quizzes and activities
- Group discussions and exercises

+61 3 9381 7888 

INFO@COVERTEL.COM.AU 

114 BAKEHOUSE ROAD, KENSINGTON VIC 3031
AUSTRALIA 

PO BOX 553, NORTH MELBOURNE, VIC 3051
AUSTRALIA 

WWW.COVERTEL.COM.AU 