



# Convergence Technologies Professional (CTP) Course 2: Telephony Networking (EMEA Version)

The *Telephony Networking* course provides detailed coverage of telephony standards and best practises for EMEA countries and North America. Through hands-on training, you will learn the vendor-independent telephony skills and concepts necessary for entry-level professionals seeking employment in the telecommunications industry.

In *Telephony Networking*, you will learn about basic telephony concepts, including loop-start trunks, common telephony standards, and PBX elements. From Line A and Line B to exchange switches, you will learn how voice and data are routed across the global public switched telephone network.

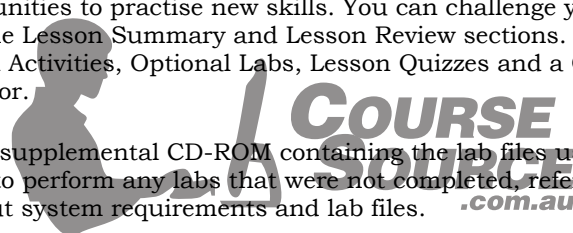
You will also learn about key infrastructure issues, including how equipment must be properly tested and secured. This course also focuses on specific troubleshooting techniques. You will learn how to use common troubleshooting tools, including a digital multimeter, a tone-and-probe kit, a line-test handset (i.e., butt set), and other tools that allow you to wire analogue and digital lines.

Finally, you will learn about analogue and digital signaling, including analogue loop-start methods, ISDN and SS7.

This course prepares you to take the Telecommunications Industry Association (TIA)-endorsed CTP (Convergence Technologies Professional) exam. This course has been written to standards specific to EMEA countries. However, the CTP exam does not focus on differences between EMEA and North American standards.

All CTP courses offer Case Studies for class discussion about real-world skills applications. Guided, step-by-step labs provide opportunities to practise new skills. You can challenge yourself and review your skills after each lesson in the Lesson Summary and Lesson Review sections. Additional skill reinforcement is provided in Activities, Optional Labs, Lesson Quizzes and a Course Assessment that are available from your instructor.

This coursebook includes a supplemental CD-ROM containing the lab files used in class. To practise the skills presented in class or to perform any labs that were not completed, refer to the Classroom Setup section for information about system requirements and lab files.



## Topics

### Telephony Essentials

- Basic Telephony Concepts
- Analogue to Digital
- Exchange Connections
- Common Voice Services and Feature Sets
- Call/Contact Centres
- Trunks and Signaling
- Digital Network Synchronization
- Cabling and Wiring
- Call-Processing Steps
- Common Analogue Transmission Impairments

### Boundaries, Numbers, Wiring and Safety

- Network Termination and Test Point (NTTP)
- Telephone Numbers
- Signaling Types
- Case Study
- RJ-11 Connectors and Wiring
- RJ-12 Connectors and Wiring
- BT-431A and BT-631A Connectors and Wiring
- Common Telephony Issues
- Testing Laboratories
- Securing Equipment

### Troubleshooting

- Troubleshooting Terms
- Troubleshooting Tools
- Troubleshooting Analogue Lines
- Troubleshooting Digital Lines

### Analogue and Digital Signaling

- Signaling Categories
- In-Band and Out-of-Band Signaling
- Analogue Signaling
- Digital Signaling
- Integrated Services Digital Network (ISDN)
- ISDN Protocols
- Private Integrated Services Network (PISN)
- Signaling System 7 (SS7)
- Computer Telephony Integration



---

## Target Audience

Field technicians, voice and telephony technicians, networking administrators, systems engineers, data-communications technicians, technical sales and marketing professionals, data professionals who need telephony, telephony professionals who need data, and any individual interested in pursuing or advancing a data or convergence technologies career.

---

## EMEA standards

This course is designed to teach universal telephony concepts. Specific labs have been written for EMEA telephony networking equipment. Countries that can use labs presented in this course include the following:

- Europe
- The United Kingdom
- Australia
- New Zealand
- Middle East
- Africa

You may be able to teach this course in additional countries, but only if you are prepared to modify existing labs by substituting equipment specific to your location. For example, you will have to obtain line connectors and phone jacks for your particular telephone system.

---

## Job Responsibilities

Implement products and services in accordance with industry standards, apply basic troubleshooting practices, verify interoperability, identify components of a converged network and the challenges of integrating circuit-switched and packet-switched networks, properly implement IP addressing plans, and establish Voice-over IP (VoIP) requirements.

---

## Course Length

*Telephony Networking* is a six-hour course.

---

## Prerequisites

Students must have completed the *Data Networking* course, or be able to demonstrate equivalent networking knowledge.