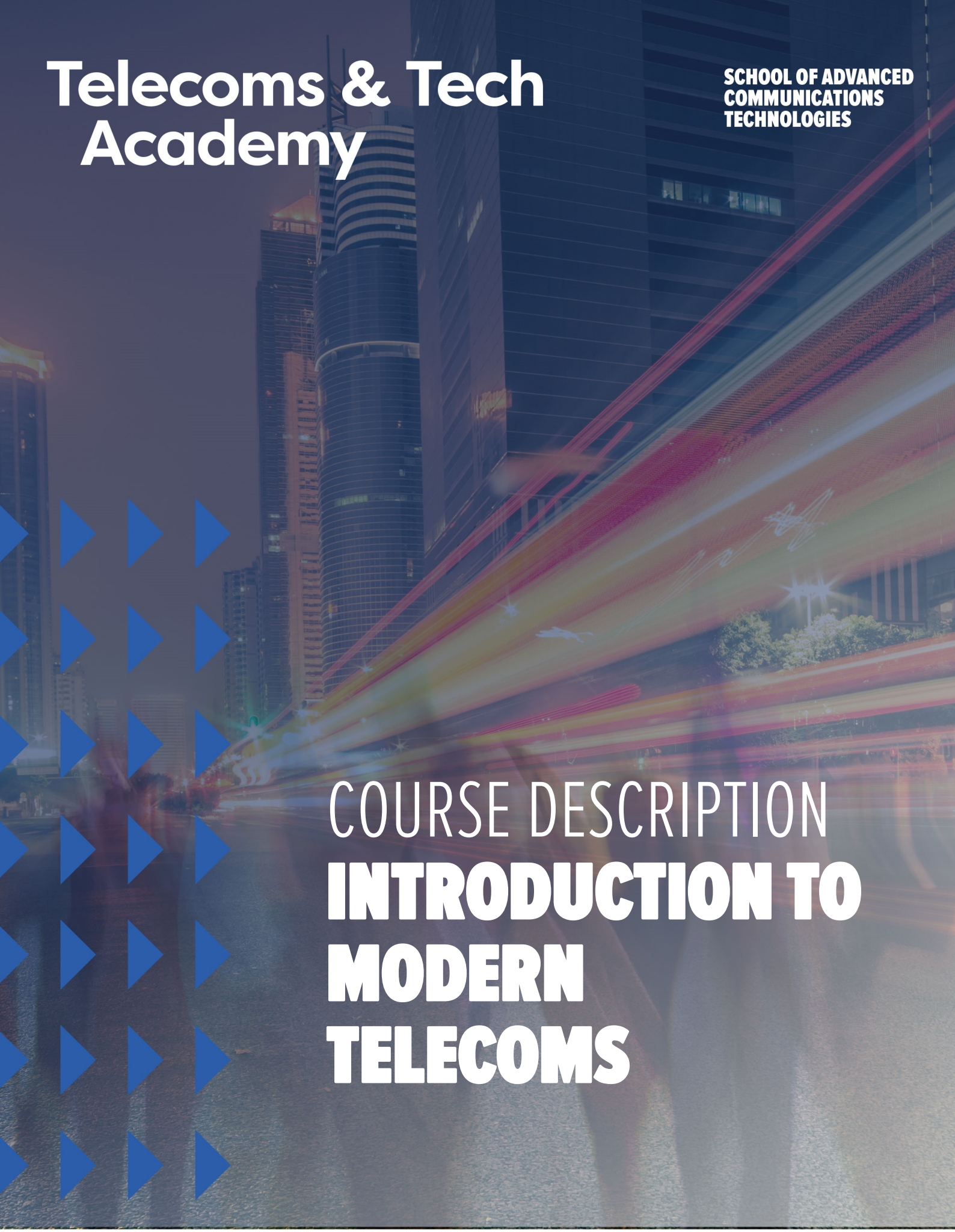
Telecoms & Tech Academy

SCHOOL OF ADVANCED COMMUNICATIONS TECHNOLOGIES



COURSE DESCRIPTION

INTRODUCTION TO MODERN TELECOMS

Format:
Classroom

Duration:
3 Days

KNect365 Learning
an informa business

COURSE SUMMARY

HIGHLIGHTS

- **Highly focused and in-depth training from the experts - including relevant updates from Informa's extensive research team**
- **Trainers and programme directors that are experts, industry experienced, and highly accomplished training professionals**
- **Training outcomes and competency development designed to meet your specific requirements**

"Brilliant course, just enough info not to over complicate, would happily recommend"

MG, Royal Mail

COURSE SUMMARY

This training course provides an excellent grounding in Modern Telecommunications, with the basics presented in a clear and easy to understand format.

Current and evolving Services, Applications, Technologies and Networks, within the Fixed, Mobile and Data/Internet environments are all examined enabling the delegate to gain a comprehensive overview of the modern Telecommunications Industry, and its rapid evolution towards a converged multimedia network.

We start by reviewing the basics - Services and Applications; Transmission, Switching & Routing; Signalling and Control; and Supporting Systems. We then look at these concepts and techniques in the context of fixed, mobile and data communications in turn - allowing us to build a complete overview of telecoms technology and its evolution.

The conception, evolution and structure of modern Data Communications are presented and discussed, resulting in a firm understanding of data concepts in the digital space. This is further expanded into Internet Protocol, the Internet and the World Wide Web where architecture and processes are examined in detail.

Examples, demonstrations, exercises and additional topics looking at the industry and the major issues it faces help participants understand the relevance of the various topics, as well as the likely direction of the industry and telecom business as a whole.

OUTCOMES & COMPETENCY DEVELOPMENT

Participants will develop or be able to:

- Chart the evolution of telecommunications and the global trends in the development of services and applications
- List and describe the relevance of the five basic requirements of all communications networks
- Discuss with confidence the emerging role of Applications and Services in the 21st Century
- Highlight and discuss the key differences and advantages of various transmission media types: Copper, Radio, Fibre-Optic and Free Space Optical, and their associated transmission systems
- Assess the main features and limitations of the major current and future Fixed Network concepts including access (Copper, Fibre and Radio), switching principles and network topologies
- Assess the major developments in Mobile Network technology (capabilities, limitations, operation and features) and chart migration paths to the most efficient and capable technologies
- Illustrate the technologies diagrammatically, showing how they are categorised according to the generational model (1G to 4G)
- Explain the fundamental concepts of IP and Data Communications within both corporate and public networks
- Discuss the operation of the Internet and the main features of its topology
- List and discuss the major features and requirements of modern Radio Systems including technologies such as Near Field Communications, Bluetooth, WiFi, WiMAX, TETRA and Satellite-based systems
- Better assess the possible business and revenue opportunities that Complimentary Technologies

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COURSE CONTENTS

INTRODUCING THE BASICS

- The Evolution of Communications
- Telecoms Fundamentals
- Services and Applications
- Transmission of information
- Switching principles
- Signalling and Control
- Supporting Systems
- Networking principles

SERVICES AND APPLICATIONS

- LTE Development
- Categories of Service
- Bearer Services & Teleservices
- Applications & Underlying Services
- Quality of Service (QoS)
- Supplementary Service provision
- Value Added Services in modern Networks
- Third Party provided services
- The overall user experience
- Service Provisioning
- Intelligent Networks
- Service Delivery Platforms (SDP)
- The IP Multimedia Subsystem (IMS)

TRANSMISSION SYSTEMS

- Definition of Transmission
- Transmission Mediums:
    - Copper
    - Radio
    - Fiber
    - Free Space Optical
    - Satellite
- Analogue and Digital systems
- Pulse Code Modulation (PCM)
- Channels & Bandwidth
- Multiplexing techniques
- Introducing Modern Transmission Systems
- Plesiochronous Digital Hierarchy (PDH)
- Synchronous Digital Hierarchy (SDH) / Synchronous Optical Network (SONET)
- Dense Wavelength Division Multiplexing (DWDM)
- PDH, SDH & DWDM Compared

SWITCHING SYSTEMS

- Principles of switching
- Introduction to Circuit Switching
- Introduction to Packet Switching
- Routers, Virtual Circuits
- Introduction to Message Switching

SIGNALLING SYSTEMS

- Explaining the principles of signalling
- The techniques used within signalling
- DTMF, in-band and out-band signalling
- Core Network Signalling
- Mobile network Signalling
- Signalling System No. 7 (SS7)
- SS7 in use
- Evolving the Switch
- Session Initiated Protocol (SIP)

SUPPORTING SYSTEMS

- The Role and scope of OSS and BSS
- BSS Supported Areas
- Call Details Records
- IP Data Records
- Mediation
- The Rating Engine
- IMS and Billing
- Diameter & Charging
- Revenue Assurance
- Customer Contact Management
- OSS Supported Areas
    - Service Provisioning
    - Operations and Maintenance
    - Fault Reporting & Rectification

TECHNIQUES USED IN MODERN FIXED NETWORKS

- Access Technologies
    - Public Switched Telephone Network (PSTN & Leased Lines)
    - ISDN
    - The Local Loop
    - Digital Subscriber Line Technologies (ADSL, VDSL)
    - Fibre to the X (FTTx)
    - Fixed Radio Access
    - Satellite Delivery
    - Cable Access
    - Passive Optical Networks
- Data Rates Compared
- Core Network Technologies
- Intelligent Networks
- 21 Century Network Example (NGN)

DATA COMMUNICATIONS

- Data Communications Networks
    - Network Requirements
    - Legacy Technologies
    - Network Building Blocks
    - Network Topologies
- Local Area Networks (LANs)
    - LAN Routers, Switches and Repeaters
    - Ethernet—Connecting up the LAN
- Wide Area Networks (WANs)
    - Metro Ethernet—Connecting up the MAN
- Wide Area Networks (WANs)
- The OSI 7 Layer Model
- Voice over IP (VoIP)
- Multi Protocol Label Switching (MPLS)

OTHER RADIO-BASED TECHNOLOGIES

- Digital Broadcasting DVB-S, DVB-T, DVB-C, DVB-H)
- Terrestrial Trunked Radio Access (TETRA)
- Satellite Communications
    - Satellite Orbits
    - Satellite Applications
    - Satellite Frequency Bands
    - Very Small Aperture Terminal (VSAT)
- Wi-Fi Technologies including VoWIFI

COURSE CONTENTS

IP AND THE INTERNET

- The Internet
- The Evolution of the Internet
- Internet Architecture
- The TCP/IP suite of protocols
- IP Data Packets
- IP addressing
- Why all IP?
- Packet Switching
- E-Mail - How it Works
- Web Browsing - How it Works
- File Transfer - How it Works
- Firewalls - How they Work
- The Domain Name System (DNS)
- The Cloud
- IPv4 vs IPv6

TECHNIQUES USED IN MOBILE NETWORKS

- Radio Channels & Spectrum
- The Base Station Subsystem (BSS)
- Radio Frequency Reuse
- The problems Encountered with Radio
- Covering Different Types of Terrain
- Environmental Considerations
- Cellular Network Evolution
- 2nd Generation Cellular Systems
    - Mobile Network Basic Structure
    - GSM Network
    - GSM Services
    - Core Network Elements
    - Mobile Call Control & Handover
    - GPRS Network
    - GPRS Services
    - Data Connections
    - EDGE Overview
    - 3rd Generation Cellular Systems
    - UMTS Data Rates
    - UMTS Network
    - UMTS Services
    - HSPA (3.5G)
    - HSPA+ (3.75G)
- 4th Generation Cellular Systems
    - LTE (3.9G)
    - From Circuit Switching to all IP
    - LTE Terminology
    - LTE Network
    - LTE Spectrum Resources
    - Data Rates Compared
    - LTE Advance (4G)
    - 3GPP & 3GPP2 Standardisation
- Messaging Technologies
    - Short Message Service (SMS)
    - Multimedia Messaging Service (MMS)

TELECOMS INDUSTRY OUTLOOK

- Summary of global key trends
- Digital Transformation
    - Digital operator, digital service provider?
    - IT transformation
    - Digital technologies: big data, AI, etc.
    - Future telco business models
- Network revolution – 5G, SDN & NFV
- IoT – evolving from M2M
    - Consumers: connected devices, smart home
    - IoT, verticals and smart cities
- ICT services
- Learning from and partnering with OTTs

OUR TRAINING SERVICES

TELECOMS & TECH ACADEMY STRUCTURE

Our training programmes are delivered worldwide as part of the training and development plans of many operators, vendors, and service providers. The programmes cover a wide range of competency development requirements.

To ensure we meet the training needs of the industry as effectively as possible, we operate three schools:

School of Telecoms Management
Business training tailored to the telecoms industry, ranging from the intensive 5-day Telecoms Mini MBA to specialist leadership and marketing training.

School of Advanced Communication Technologies
Covering a multitude of technologies, these courses range from overviews aimed at nontechnical staff to in-depth engineering training.

Distance Leaning
Our comprehensive suite of Distance Learning programmes provide an excellent opportunity to expand knowledge and build confidence.

OUR TRAINERS

We only use trainers and programme directors that satisfy the following three criteria:

- Experts in their field
- High level of Industry Experience
- Expert facilitators and training professionals.

All our trainers have undergone a rigorous election process and are subject to continuous monitoring and evaluation. Each trainer is accredited for specific courses or topic areas. Whether engineers or business experts, all our trainers are required to continue their own development within their specialist areas, and to broaden their Industry view of trends, best practice and technology.

This is achieved by our on-going work with many tier 1 operators and vendors, and by full exposure to Ovum research and KNect 365 TMT worldwide events.

UNIVERSITY ACCREDITATION

Some of our programmes have been accredited by the University of Derby Corporate; a UK-based university highly acclaimed in the area of employer engagement. They are at the forefront of the drive to integrate highly focused industry -led training with the academic rigor and quality control of university-based education. Our comprehensive Advanced Telecoms Management Series have been accredited Post-Graduate Level, with our extensive suite of Distance Learning at Undergraduate Level)

We would be happy to discuss extending accreditation to tailored ATMS or programmes based on our Distance Learning modules. Although accreditation is specific to these programmes, the work we do with the University of Derby enable us to develop and apply best practice across our portfolio.

CUSTOMISED IN-HOUSE TRAINING

Telecoms & Tech Academy has worked with countless companies to deliver customised training programmes. We take time to understand your requirements, you'll work with our specialist training team to ensure that we deliver your perfect training programme for your business.

A customised training programme from Telecoms & Tech Academy ensures you get a course that precisely matches your organisation's needs, presented by a first-rate training organisation, with access to all the latest industry research and analysis.

WHY CHOOSE IN-HOUSE TRAINING FROM TELECOMS & TECH ACADEMY?

- Content can be customised to focus on the issues you want – work with us to develop the training course to match the exact needs.
- Unique industry research – from Ovum's team of industry leading analysts
- Expert trainers – our team of versatile trainers have the knowledge and experience to deliver a highly effective learning experience
- The most efficient way to train your staff – at the time and location to minimise disruption
- Flexible delivery options – with a range of instructor led, distance learning and virtual classroom formats available you can build a blended solution to maximise training effectiveness over the long term
- Pre and post course assessment – can be included in programmes to measure competencies and check on the required progress.

Contact us to discuss how we can build your perfect programme.

www.telecomstechacademy.com

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