

Data Centre Infrastructure Fundamentals Course

22 – 26 February 2027
Barcelona (Spain)

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Ref: 321731_298282 **Date:** 22 – 26 February 2027 **Location:** Barcelona (Spain) **Fees:** 5900 GBP

Data centre infrastructure fundamentals are the core building blocks of a facility that keeps servers running: power supply, cooling, cabling, physical security, fire suppression and the routines that operate them day to day. This five-day course is for technicians, facilities staff and IT operations staff who are new to data centre work or broadening into it, and its final deliverable is a facility operations checklist with a basic capacity and risk review.

Introduction

Two references frame the course. ANSI/TIA-942 is a telecommunications infrastructure standard for data centres covering spaces, cabling, power, cooling and redundancy. The Uptime Institute Tier Classification describes four tiers of data centre redundancy and maintainability. Power Usage Effectiveness PUE, the ratio of total facility energy to IT equipment energy, is used to discuss efficiency. The level is professional entry: the focus is understanding and operating infrastructure well, not designing new facilities. Teaching uses walkthroughs of floor layouts, case studies from banking and telecom facilities, and checklist exercises.

Course Objectives

- Define the main infrastructure systems of a data centre and explain how power, cooling and cabling depend on each other
- Distinguish Uptime Institute tiers and TIA-942 ratings and interpret what each says about redundancy
- Compare UPS, generator and power distribution arrangements and select checks that keep them reliable
- Apply preventive maintenance, monitoring and KPI routines that reduce unplanned downtime
- Interpret capacity data for power, cooling and space to judge when expansion or virtualisation is needed
- Justify physical security, fire suppression and continuity measures for a facility of a given tier

Target Audience

- Data centre technicians and shift staff who must decide which alarms and readings need immediate action
- Facilities and electrical staff moving into data centre work who must judge how changes affect uptime
- IT operations and infrastructure staff who must choose where new equipment can be placed safely
- Network and cabling technicians who must select cabling practices that keep the floor manageable
- Junior facility coordinators who must assess whether maintenance and access records meet requirements

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Course Outline

Day 1: Data Centre Basics, Roles and Standards

- Evolution of Data Centres: From Server Rooms to Enterprise, Colocation and Edge Facilities
- Roles and Responsibilities in Operations: Facilities, IT, Security and Shift Teams
- Uptime Institute Tiers vs TIA-942 Ratings: Two Ways to Describe Redundancy
- Regulatory and Compliance Considerations: Safety, Data Handling and Audit Requirements
- Data Centre Spaces and Layout: Computer Room, Entrance Room and Support Areas

Day 2: Power, Cooling and Physical Infrastructure

- UPS vs Generator Power: Short-Term Ride-Through Compared with Long-Duration Backup
- Power Distribution and Efficiency: Switchgear, PDUs and Power Usage Effectiveness
- Cooling Solutions: Hot and Cold Aisles, Containment and Precision Air Conditioning
- Structured Cabling and Network Connectivity: Topologies, Pathways and Labelling Practice
- Fire Detection and Suppression: Early Warning Detection and Clean Agent Systems

Day 3: Monitoring, Maintenance and Change

- Preventive vs Reactive Maintenance: Scheduled Care Compared with Repair After Failure
- Proactive Monitoring Tools: Environmental Sensors, Alarms and Infrastructure Dashboards
- Key Performance Metrics for Operations: Availability, PUE, Incidents and Response Times
- Incident Management and Response Procedures: Escalation, Communication and Recovery Steps
- Change Management for New Systems: Approvals, Method Statements and Rollback Plans

Day 4: Capacity Planning and Resource Use

- Power vs Cooling vs Space Capacity: Finding Which Limit Is Reached First
- Capacity Planning Methodologies: Tracking Demand and Forecasting Infrastructure Needs
- Resource Allocation: Placing Hardware to Balance Load, Heat and Rack Space
- Virtualisation and Cloud Computing: How They Change On-Site Capacity Needs
- Scalability and Future-Proofing: Modular Growth in a Changing Digital Environment

Day 5: Security, Continuity and Operations Practice

- Physical Security vs Logical Security: Access Control Compared with System Protection
- Risk Assessment and Business Continuity: Mitigation and Disaster Recovery Planning
- Sustainability and Emerging Trends: Green Initiatives, IoT, Edge Computing and AI Operations
- Facility Case Study Exercise: Applying Tier, Capacity and Maintenance Checks to a Site
- Facility Operations Checklist with Capacity and Risk Review: Completing the Final Deliverable

Skills You Will Gain

- Tier Classification Reading
- UPS and Generator Checks
- Airflow Management
- Structured Cabling Practice
- Infrastructure Monitoring
- Incident Response
- Capacity Tracking
- Physical Access Control

Why Attend This Course

- From treating the data centre as a black box to understanding how power, cooling and cabling depend on each other
- From reacting to alarms one by one to following monitoring, maintenance and incident routines
- From placing equipment wherever there is space to checking power, cooling and rack capacity first
- From informal habits to a facility operations checklist with a basic capacity and risk review

Conclusion

A data centre runs reliably when its people understand the infrastructure beneath the servers and look after it with steady routines. The course makes three distinctions clear: UPS versus generator power, preventive versus reactive maintenance, and power, cooling and space as separate capacity limits. It suits technicians, facilities staff and IT operations staff at professional entry level who want five days on operating infrastructure, rather than an expert course on designing and implementing new facilities.

Course FAQs

What are data centre infrastructure fundamentals?

They are the essential systems that keep IT equipment running, namely power supply and backup, cooling, structured cabling, physical security and fire suppression, together with the monitoring and maintenance routines used to operate them.

What is the difference between Uptime Institute tiers and TIA-942 ratings for data centre infrastructure?

Both describe redundancy and resilience in four levels. Uptime Institute tiers focus on performance outcomes such as concurrent maintainability and fault tolerance, while TIA-942 also sets requirements for spaces, cabling and supporting infrastructure.

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A graphic illustration of a chessboard with several chess pieces. A large gold king piece is prominent in the foreground, with a silver pawn and a gold pawn nearby. The background shows concentric circles emanating from behind the pieces.

Which standards does the data centre infrastructure fundamentals course follow?

The course follows ANSI/TIA-942 for infrastructure requirements, refers to the Uptime Institute Tier Classification for redundancy levels and uses Power Usage Effectiveness to discuss energy efficiency.

Is data centre infrastructure fundamentals training suitable for a facilities electrician?

Yes. Electricians moving into data centre work learn how UPS, generators and power distribution fit with cooling, cabling and change control, and how their tasks affect uptime.

What do delegates produce in data centre infrastructure fundamentals training?

Delegates produce a facility operations checklist for a case site, covering power, cooling, cabling, security and fire suppression checks, together with a basic capacity and risk review.

A graphic of a chessboard with several chess pieces. A gold king piece is prominent in the foreground, with a silver pawn and a gold pawn behind it. The board is checkered and has a subtle grid pattern.

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