



CERTIFIED DATA CENTRE SPECIALIST

Introduction

With few exceptions, enterprises today rely on IT for the delivery of business-critical services - often directly to the end consumer. It is therefore vital that the mission-critical data centre is designed, maintained and operated with high-availability and efficiency in mind. However, the fact is most data centres do not meet the full availability, capacity, safety or efficiency requirements that are often demanded.

The Certified Data Centre Specialist is a three-day course designed to bring participants to the level of a suitable sparring partner with suppliers. They will be able to verify offers provided by vendors for correctness, effectiveness and efficiency. CDCS[®] is a must-have certification for professional data centre managers and personnel. CDCS[®] is a pre-requisite for individuals wishing to achieve the elite CDCE[®] (Certified Data Centre Expert) status.

Roadmap



Audience

The primary audience for this course is an IT, facilities or data centre operations professional working in and around the data centre and having the responsibility to achieve and improve high-availability and manageability of the data centre.

Prerequisites

Participants must hold a valid CDCP[®] certificate in order to be able to register for the CDCS[®] class.

Global Accreditation & Recognition



Course Benefits

After completion of the course the participant will be able to:

- Understand the design life cycle of data centres and the stages involved
- Discuss the data centre requirements in great level of detail with vendors, suppliers and contractors to ensure that these requirements are met
- Validate design plans, quotes and offers proposed by vendors/contractors
- Understand redundancy levels for both the data centre design/setup and maintenance
- Understand the various building considerations such as bullet proofing, mitigation of seismic activity, fire ratings and thermal stability
- Understand how to install a raised floor that meets requirements, avoiding misalignment, level differences and leakage
- Understand how to read a Single Line Electrical Diagram to identify and avoid the most common design issues
- Choose the correct UPS and parallel configuration, learn and avoid classic parallel installation mistakes
- Understand how to calculate battery banks, validate offered configurations to ensure they meet requirements
- Understand what distance to keep to avoid EMF issues for human safety and equipment disturbances
- Understand the fundamental cooling setup, CFM, Delta-T and other important factors
- Understand contamination factors and limitations
- Understand full details of fire suppression options, how to calculate gas content and verify installations
- Understand how to measure data centre energy efficiency and how to improve it

- **Data Centre Design/Life Cycle Overview**
 - Overview of the phases of a data centre life cycle
 - Planning, re-alignment and continuous improvement
- **Standards and Rating Level Definitions**
 - Rating level history
 - Standards and guidelines compared (TIA-942, ISO 22237, EN 50600, UTI)
 - Rating level definitions
 - Redundancy options (N+1), 2N, 2(N+1)
 - Concurrent Maintainability/Compartmentalisation
 - Example configurations
 - Substation and feed requirements
 - Maintenance options
 - Operational processes guidelines/standards
 - Skill development
- **Building Considerations**
 - Building location considerations
 - Floor and hanging loads requirements
 - Fire rating for walls and glass
 - Blast protection
 - Bullet proofing
 - Forced entry protection
- **Advanced Raised Floor & Suspended Ceiling**
 - Raised floor installation guidelines
 - Techniques to install a proper and leveled raised access floor
 - Common mistakes
 - Choosing the right tiles and their locations
 - Seismic-mitigating floor constructions
 - Choosing the correct suspended ceiling
- **Advanced Power**
 - **Power infrastructure layout;**
 - Formulas which you should know for the data centre
 - Single Line Electrical diagrams; how to read to ensure key components are present for protection
 - Over current protection devices (MCB/MCCB/VCB/ACB/Fuses) definitions and what to use where
 - Earth Leakage devices (RCB/RCD/ELCB/GFCI/ALCI/RCBO), definitions and what to use where
 - Sizing of protective components
 - Lightning strikes and surge protection devices (TVSS/SPD), how they operate, where to use and how to install
 - Power cabling and cable run considerations
 - PDU/DB setup and minimum requirements
 - **Generators;**
 - Generator types: Standby/Prime/Continuous
 - Component make up and functions
 - Fuel storage and calculation
 - Paralleling of gen-sets
 - Generator room/area requirements
 - **UPS Systems;**
 - Required specifications for UPS systems
 - How to read data sheets and select the correct UPS
 - Requirements for parallel configurations and avoid pitfalls such as single point of failures
 - How parallel installation should be done, classic mistakes made by installers and how to avoid these
 - **Harmonic Filters;**
 - Active/Passive filters and their application
 - **Battery Banks;**
 - Battery bank terminology
 - Designing battery banks, how to calculate, and double check the battery bank to be installed
 - Battery charging pitfalls and ensuring the right charger is being installed and used
 - Using parallel battery banks; how to properly install them, limitations and risks when using batteries in parallel
 - How to test batteries correctly and make decisions on cell/block or string replacement
 - Battery casing choices; ABS, V0, V1, V2
 - Alternative energy storage; flywheel, re-usable cell, compressed air UPS, etc.
- **Advanced Electro Magnetic Fields**
 - Sources of EMF
 - Difference between single, three phase and bus-bar EMF
 - Options available to measure EMF and how to interpret the results from single-axes and composite measurements
 - Guidance on safe distance for equipment and humans
 - Calculation of EMF attenuation factor for shielding material permeability and saturation factors
- **Advanced Cooling**
 - Important definitions; dry-bulb, wet-bulb, dew-point, RH, sensible and latent heat
 - Psychrometric chart and ASHRAE recommendations
 - Environmental class definitions and thermal specifications
 - Temperature/humidity measurements guideline
 - Heat dissipation methods
 - Altitude impact on temperature intake to ICT equipment
 - Floor plan setup for effective cooling
 - Differences in tile surface and supporting structure and the air-flow performance impact
 - Rack door construction and the flow performance impact
 - Equipment Delta-T and its impact
 - Optimising airflow
 - Thermal units conversions
 - Calculations for air volume displacement (CFM/CMH)
 - Cooling capacity calculations
 - Air-conditioning selection
 - De- / humidifying options
 - Air conditioning efficiency
 - SHR impact on cost saving
 - Efficiency indicator
 - New cooling principles and techniques (Liquid, liquid submerged, VSD/VFD/EC Fans/VRF/water- and air side economisers)
 - Redundancy guidelines for air-conditioners avoiding classic misconceptions and mistakes for meeting ANSI/TIA-942 compliant designs
 - Installation requirements
 - Connections to fire panel and EPO
 - Commissioning of air conditioners
 - Set points and calibration
 - CFD (Computational Fluid Dynamics)
- **Advanced Fire Protection**
 - The fire triangle and elements to stop a fire
 - Detection systems in detail (VESDA, VIEW, smoke sensors)
 - Considerations for installation of sensors
 - Proper testing of smoke sensors
 - Water based systems i.e. deluge, wet-pipe, dry-pipe, pre-action and why most of them don't work and how to detect this
 - Details on Inert and Halocarbon systems and how to select the correct system for your data centre
 - How to calculate the gas content ensuring the appropriate level is installed to suppress the fire including safety considerations
 - Other requirements for gas systems such as release times, hold times, pipe install requirements and other important factors
 - Requirements for the fire detection panel
 - Installation verification, methods, what to check and how
 - New advanced fire suppression technologies
- **Design and Install Scalable Networking Cabling System**
 - ANSI/TIA942 cabling structure topology
 - Copper and fibre cabling
 - ToR, EoR Design
 - Intelligent patching systems
 - Installation best practice such as routing, bending radius, separation from power, containment fill ratio, fibre link loss calculator, bonding and grounding requirement
 - Standard for telecommunications labeling and administration
- **Environmental Specifications and Contamination Control**
 - Acoustic noise effects, regulations, specifications and limits
 - Data centre contaminations and classifications
 - Measurements, standards and limits
 - Preventive measures and avoidance
- **Data Centre Efficiency**
 - Business drivers to go Green
 - Sustainability versus high-availability
 - Green standards and guidelines
 - Power Usage Effectiveness (PUE), values, classes, considerations and improvements
 - Open Compute Project (OCP)
 - Savings on cooling infrastructure
 - Savings on light infrastructure
- **Mock Exam**
- **EXAM: Certified Data Centre Specialist**



Delivery Structure and Methods

The CDCS® course is lectured by an EPI Certified Instructor using a combination of lectures and question-and-answer sessions to discuss participants' specific needs and challenges experienced in their own data centre environments. Participants are able to tap into the extensive experience of the trainer enabling them to validate and improve their own environments thus adding tremendous business value.

CDCS® course is available in the following delivery methods:

- ILT – Instructor Led Training
- VILT – Virtual ILT
- TOD – Training On Demand

The classes are available on public schedule as well as private group training.

Examination

The exam is a 90-minute closed book exam, with 60 multiple-choice questions. The candidate requires a minimum of 45 correct answers to pass the exam.

Certification

Candidates who successfully pass the exam will receive the official 'Certified Data Centre Specialist' certificate. The certification is valid for three years after which the student needs to re-certify. More information is available on the EPI corporate website at www.epi-ap.com.

Global Accreditation & Recognition

The CDCS® course and certification is accredited by EXIN, which is a global, independent and not-for-profit accreditation and examination institute. EXIN's mission is to improve the quality of the IT and data centre sectors, the proficiency of IT and data centre professionals and the IT users, by means of accreditation of course material as well as independent examination and certification. Every day, EXIN examinations are taken in more than 125 countries on six continents, and in more than 15 languages.

Recommended Next Course

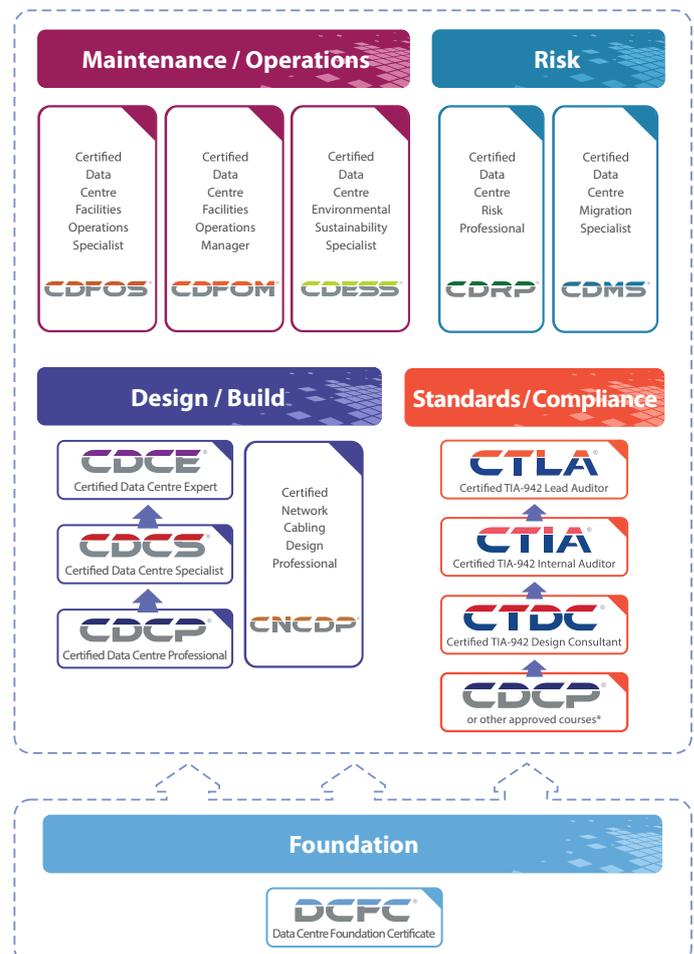
Candidates with a desire to become a data centre expert are recommended to take the CDCE® course. CDCE® prepares participants to manage a project which covers scope, plan, design, implement, and retire or move a mission critical data centre up to the highest redundancy level.

Course Schedule

Our courses are available in over 60 countries across all continents. For a comprehensive course schedule, visit the EPI corporate website at www.epi-ap.com or contact your local authorised reseller/partner.

EPI Data Centre Training Framework®

The EPI Data Centre Training Framework® provides a structured course curriculum for individuals working in and around data centre facilities and data centre operational management. It addresses the various disciplines required to design and manage a high-availability, efficient data centre. EPI's data centre course curriculum is not only the first in the world, it is also by far the largest in the industry. Many companies have specified these courses as prerequisites for their staff working in and around the data centre and use them as part of their career planning initiatives. Recognized globally, these certifications add value to both companies and individuals.





The Company

EPI is a data centre specialist company of European origin operating world-wide in over 60 countries through direct operations and a large partner network. EPI offers an extensive range of data centre services on auditing, certification and training. EPI's focus is on mission-critical, high-availability environments. Established in 1987, EPI has developed an international reputation for delivering high quality technical expertise, with flexible and innovative services, techniques and methodologies.

All our services are aimed at helping our customers to:

- Increase **Availability** of their mission-critical infrastructure
- Improve **Efficiency, Effectiveness and Manageability**
- **Minimise risk** of business interruption

Our Clients share a common need to protect their valuable data, run their mission-critical infrastructure efficiently and to be protected on a 24 x 7 basis. By protecting the interests of our customers, EPI is committed to an intensive program of comprehensive services development backed by engineering and support excellence.

Quality Systems and Procedures have always been at the heart of every stage of our service delivery to ensure consistent and high quality services. We are known for our thoroughness, flexibility and responsiveness. We focus on providing services that fit each organization and each project with a drive to deliver quality on time, every time.

Let us put our expertise to work for you!

Data Centre Services

Audit & Certification

- Data Centre Standards
 - ANSI/TIA-942
 - EN 50600
 - DCOS®
 - ISO/IEC TS 22237
- Other International Standards
 - ISO 9001
 - ISO 14001
 - ISO 14644
 - ISO/IEC 20000-1
 - ISO 22301
 - ISO/IEC 27001
 - ISO/IEC 27701
 - ISO 37001
 - ISO 45001
 - ISO 46001
 - ISO 50001
 - PCI DSS
- Singapore Standards
 - SS 507
 - SS 564
 - SS 584
 - DTPM
 - CBPR
 - PRP

Professional Training & Certifications

- Data Centre
 - DCFC®, CDCP®, CDCS®, CDCE®, CNCDP®, CDFOS®, CDFOM®, CDESS®, CDRP®, CDMS®, CTDC®, CTIA®, CTLA®
- IT
 - CITO®, CITM®, CITD®

Non-Certification Training

- Digital Transformation

Frameworks

- IT&DCF® - IT & Data Centre Framework
- DCCF® - Data Centre Competence Framework
- DCTF® - Data Centre Training Framework
- ITTF - IT Training Framework

Standard

- DCOS® - Data Centre Operations Standard



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