

## دوره CDCP دیتا سنتر | Certified Data Centre Professional

شرح مختصر

آشنایی با اجزای اصلی دیتا سنتر و امور مربوط به آن

### مروری بر دوره

مروری بر دوره

شما با شرکت در این دوره با اجزای اصلی دیتا سنتر آشنا خواهید شد. این دوره نیازهای شما در زمینه مباحث مربوط به دیتاسنتر همچون سیستم تغذیه، سرمایش، ایمنی و غیره را پوشش خواهد داد. آشنایی با عملیات و نحوه نگهداری از دیتا سنتر جزو دیگر مباحثی خواهد بود که در این دوره به آن پرداخته خواهد شد.

### آنچه در این دوره خواهید آموخت

آنچه خواهید آموخت

- طراحی و اجرای فضا بندی ، سقف و کف کاذب
- طراحی و اجرای انواع سیستمهای الکتریکال
- طراحی و اجرای سیستمهای سرمایشی
- طراحی و اجرای سیستمهای اعلان و اطفا
- طراحی و اجرای سیستمهای امنیتی
- طراحی و اجرای انواع توپولوژی پسیو
- طراحی و اجرای سیستمهای روشنایی

### سرفصل ها (حضور)

سرفصل ها



- Lesson ۱ - The Mission Critical Site
- Data centre's; the foundation of any organization
- Downtime and its consequences
- The data centre and the value at stake
- The complexity of data centres
- Risk factors for data centres
- Main causes of downtime
- Predominant causes for data centre failures
- The moral of the story
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## Lesson ۲ - Data Centre Standards

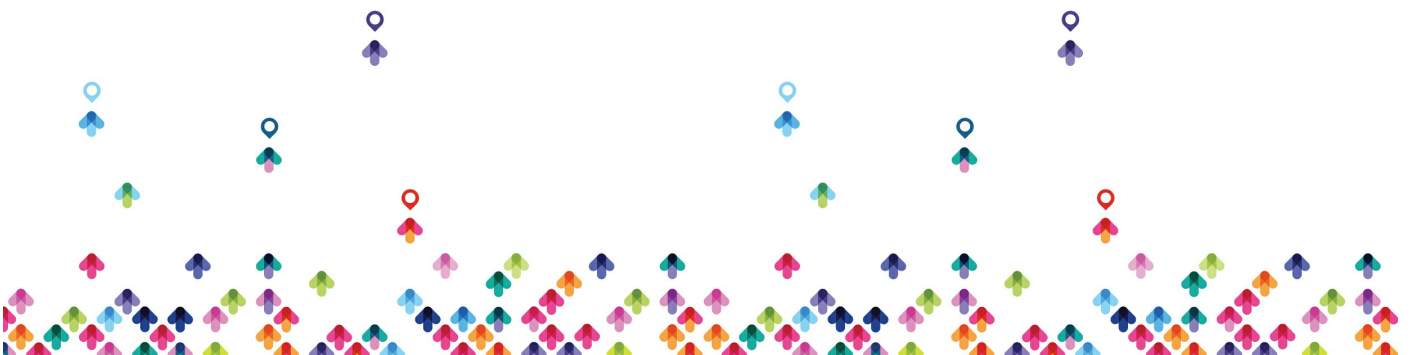
- Data Centre standards
- ANSI/TIA-۹۴۲ redundancy levels
- Standards used for data centre's
- International versus national standards
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## Lesson ۳ - The Data Centre location, Building and Construction

- Site selection criteria
- Site selection criteria: Location evaluation
- Site selection criteria: Location (cont.)
- Site selection criteria: Building
- The Data Centre and supporting facilities
- Holding area
- Staging area
- Computer/Server room
- Media storage area
- UPS room
- Battery room
- Service corridor
- Standby generator set room/area
- Meet-Me I Entrance room
- Security room
- NOC (Network Operations Control)/Command centre
- Classic mistakes
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## Lesson ۴ - Raised Access Floor and Suspended Ceiling



- Raised floor
- Loading factors
- Raised floor: Standards (Metric)
- Raised floor: Standards {Imperial}
- Raised floor (Metric)
- Raised floor {Imperial}
- Raised floor; General guidelines
- Grounding of raised floor
- Grounding of raised floor
- Cutting holes in a raised floor tile
- Ramps
- Other considerations
- Suspended ceiling

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#### lesson ۵ - light

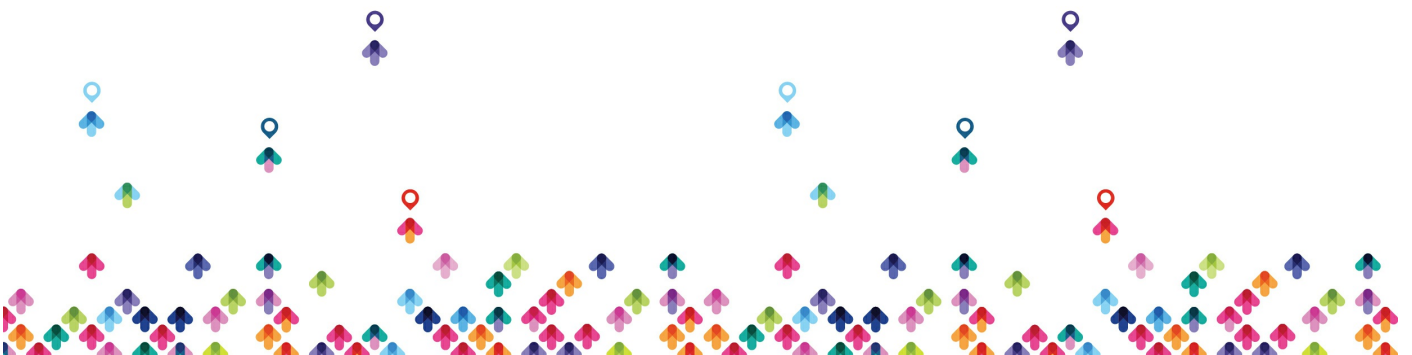
- Light definition and unit of measure
- Standards
- light fixtures and placement
- Emergency light
- Type of emergency lights

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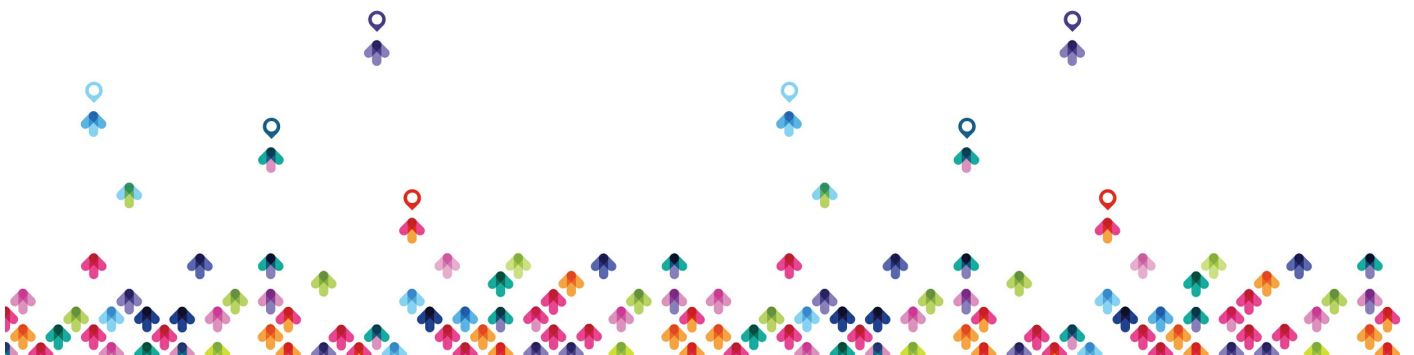


## lesson ۶ - Power Infrastructure

- Power supply quality
- Ever increasing power requirements
- New technologies on the horizon
- From source to destination
- In the building, redundancy options
- Function of the ATS panel
- In the building, redundancy options
- In the building, redundancy options (cont.)
- Function of the STS panel
- In the building, redundancy options (cont.)
- Three phase power cabling
- Conversion from three phase to single phase
- Three phase/ Single phase usage
- Proper power cable routing
- Rack power distribution - dual feed
- Dual power sources
- Option ۱: Love availability
- Option ۲: Slightly better availability
- Option ۳: Improved availability
- Option ۴: High-availability (example A)
- Option ۴: High\_ -availability (example B)
- Common techniques for power availability
- Power distribution within the Data Centre



- Cabling or busbar trunking
- Grounding in the data centre
- Common Mode Noise (CMN)
- Grounding
- Common Mode Noise (CMN)
- Bonding of neutral & ground
- Data centre power distribution - Good
- Data centre power distribution - Best
- Isolation transformers
- Distribution boards
- Form factors
- Form factor examples
- IP (Ingress Protection) protection grades
- IP protection grades - first number
- IP protection grades - second number
- Power Quality
- Power quality; guidelines
- CBEMA / ITI{C} curves
- Power quality; harmonics
- Power; real versus apparent
- label power versus actual power consumption
- Sizing up power usage for the data centre (sqft)
- Sizing up power usage for the data centre (sqmtr)
- Data Centre incoming power sizing
- Generator sets
- UPS technology



- Static UPS systems
- Dynamic UPS systems
- Static UPS technologies
- Offline I Standby UPS (VFD)
- Offline / Standby UPS (VFD)
- line interactive UPS (VI)
- True online double conversion (VFI)
- Quick comparison table
- Energy friendly options
- UPS in normal mode
- UPS running on batteries
- UPS running on static bypass
- UPS running on maintenance bypass
- Increasing availability of UPS installation
- Bypass I Hot-standby parallel
- Parallel redundant UPS
- Isolated parallel redundant
- Dynamic UPS; normal utility mode
- Dynamic UPS; change to diesel mode
- Dynamic UPS; continuous diesel supply mode
- Dynamic UPS; return to normal mode
- Main battery technologies for UPS
- Flooded cells
- SIA / VRLA
- Nickel cadmium
- Battery testing and testers



- Thermo graphic scanning

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## lesson ۷ - Electro Magnetic Fields

- Electromagnetic spectrum
- Electric & magnetic fields
- What causes EMF?
- What the vendors say
- EMF - effects on integrated circuits
- Magnetic fields and network cabling
- Biological effects of EMF
- Standards
- EMP /HEMP
- EMF -best practices during design phase
- Design/installation analysis
- EMF protection by using shielding
- Shielding performance

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## lesson ۸ - Equipment Racks

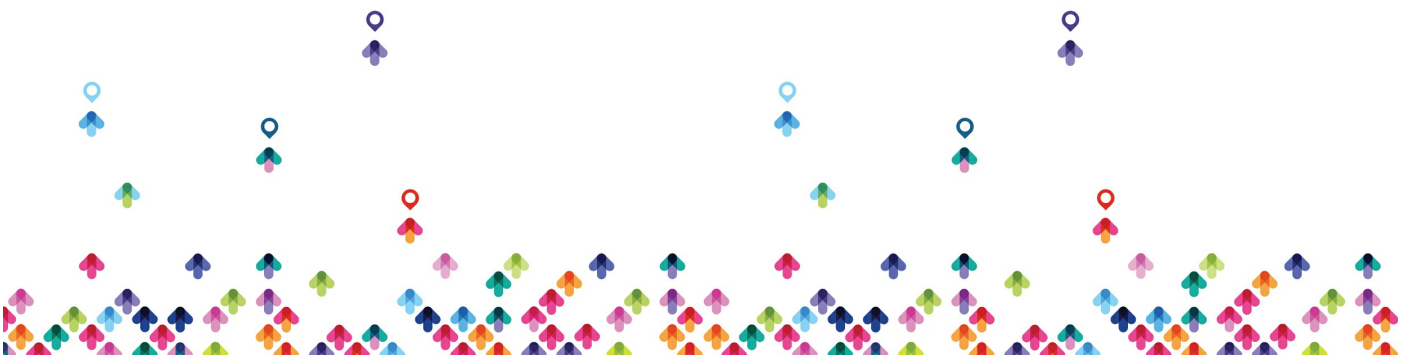




- Type of racks and standards
- Width of racks
- Width of racks
- Which rack to use
- Glass door racks
- Perforated/Grated door racks
- Mesh door racks
- Base of the rack
- Color of the rack
- Security
- Power Rails/Strips
- Power Rails/Strips
- Additional considerations
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## Lesson ۹ - Cooling Infrastructure

- Data centre cooling
- Recommended Temperature/Humidity
- Recommended humidity
- Cooling and its impact on Reliability
- Future cooling
- Cooling capacity
- Sensible/Latent Heat
- Cooling Systems
- Difference between Comfort and Precision Cooling



- Basic principle of Air Conditioning
- Air-Conditioning: Air-cooled, Self-Contained
- Air-Conditioning: Air-cooled, Split System (DX)
- Air-Conditioning: Fluid-Cooled (Glycol)
- Air-Conditioning: Water Cooled
- Air-Conditioning: Chilled Water
- Top Flow or Down Flow
- 'Raised floor' versus 'no raised floor'
- Cooling Concepts; Raised Floor
- Raised Floor
- Principle of Raised Floor Design
- 'Class Room' setup
- Hot- and Cold-Aisle Setup
- Hot- and Cold-Aisle Setup with Suspended Ceiling
- Air Conditioning Positioning
- Placement of equipment in rack
- Avoid Leakage and Short Circuit Air
- Temperature and Air Volume
- CFM /CM H
- Perforated tile and equipment placement
- Computer Room
- Cooling Concepts; Non-Raised Floor
- Non-Raised floor solutions
- Non-Raised floor cooling options; In-Row
- Non-Raised floor cooling options; Overhead Duct
- Non-Raised floor cooling options; Overhead Duct



- Cooling Concepts; Supplemental Cooling
- High Density Cooling: Air Duct Fan
- High Density Cooling: Hot Air Fans
- High Density Cooling: Overhead Supplement Air
- In-Row Cooling
- Rear door heat exchanger
- High Density Cooling; Self-Contained Racks
- Self-Contained Racks
- Cooling Concepts; Containment
- Hot Aisle or Cold Aisle Containment?
- Containment potentially impacts Fire Suppression
- Partial containment
- Break Containment with Retractable Roof
- Hypoxic-Air Fire Prevention
- Fire Suppression within the Contained Area
- Hot Aisle or Cold Aisle Containment?
- Cold Aisle Containment
- Hot Aisle Containment
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## Lesson ۱۰ - Water Supply

- The importance of water in a Data Centre



- Backup water supply; Water storage tanks
- Backup water supply; 'Well' water
- Backup water supply; Well water - risks
- Backup water supply; Retention pond

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## Lesson ۱۱- Designing a Scalable Network Infrastructure

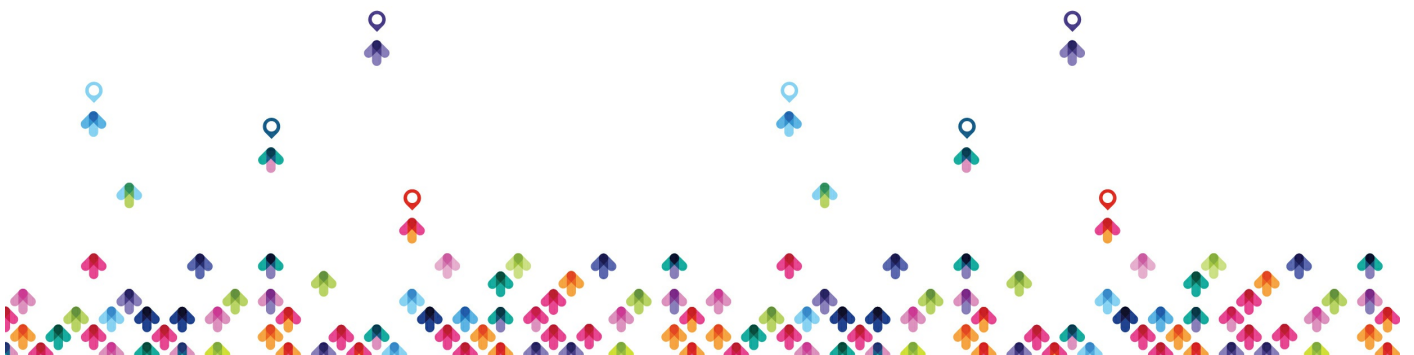
- The importance of a structured cabling system
- Planning considerations
- Structured versus on-demand system
- Cabling characteristics - Copper cables
- Copper cables
- Copper termination/ patch panels
- Fiber cables
- Cabling characteristics - Fiber cables
- Single mode versus multi mode
- Common fiber support lengths versus speed
- Fiber terminations/ patch panels
- TIA ۹۴۲ network cable logical architecture
- TIA ۹۴۲ network cable/ Rating levels illustration



- Cabling recommendation by TIA-۹۴۲A (۲۰۱۲)
- Testing and verifying structured cabling
- Storage Area Networks (SAN)
- Network redundancy
- Building to building connectivity - Telco
- Building to building connectivity- Hardware
- Building to building connectivity- Canopy
- Building to building connectivity - FSO
- Network monitoring
- Network monitoring system required capabilities
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## Lesson ۱۲ - Fire Protection and Safety

- Fire protection and safety Requirements for Data Centre fire suppression
- Standards
- Detection systems
- Fire suppression system
- Best practices for main fire suppression
- Handheld extinguishers
- Signage and safety
- Regulatory requirements/ Best practice



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## Lesson ۱۳ - Data Centre Monitoring

- The challenge
- Data Centre monitoring requirements
- EMS versus BMS
- Remote monitoring solution
- What to monitor?
- Water leak detection
- Alarm panels based on zones
- Alarm panels based on zone and/or distance
- Notification
- Is your environment monitored?

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## Lesson ۱۴ - Operational Security and Safety

- The big question
- Data Centre security
- Physical security
- Door controls
- Security within the Data Centre
- Infrastructure security
- Organizational/process security



- Security requires continuous improvement
- Operational safety
- Fire safety
- Essential signage

#### • Lesson ۱۵ - Labeling

- Rack numbering and labeling
- Labeling of UPS, Iso Trans, PDU's, breakers
- Labeling of network cabling

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#### Lesson ۱۶- DocumentationDocumentation

- Procedures and discipline
- Document management ۴۲۹

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#### Lesson ۱۷-Cleaning Practices

- Cleaning of Data Centre's
- Data Centre vacuum cleaners
- Cleaning the raised floor
- Cleaning of equipment
- Cleaning above the suspended ceiling
- General computer room rules



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## lesson ۱۸ - MTBF / MTTF / MTTR Objectives

- MTBF | MTIR/ MTTF definitions
- MTIF-MTTR-MTBR Relation
- Reliability versus availability
- MTBF, any value?

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## lesson ۱۹ - SLA, OLA and Maintenance Contracts

- Objectives
- SLA and OLA
- Maintenance contracts
- Evaluating the service provider
- Minimum requirements maintenance contract
- Best bang for the buck
- Maintenance contracts & service records
- Warranty

## مخاطبان دوره

مخاطبان دوره

مدیران، کارشناسان، کارمندان و دانشجویان و همه علاقه مندان در این حوزه تمام کسانی که می خواهند در شبکه زیر ساخت کشور به صورت حرفه ای و درآمدزا وارد شوند.





## پیش نیازها

پیش نیازها

BICSI ۰۰۲ •

