

## Certified Data Centre Facilities Operation Management (CDCFOM)™

### Course Outline



[www.gaqm.org](http://www.gaqm.org)

#### What Modules are covered?

##### Module 1 – Fundamentals of Availability

- Introduction
- Measuring Business Value
- Five 9's of Availability
- Limitations of 99.999%
- Factors affecting Availability
- A/C Power Conditions
- Cooling Issues
- Equipment Failures
- Natural and Artificial Disasters
- Human Errors
- Cost of Downtime
- Calculating Cost of Downtime

##### Module 3 – Fundamentals of Cabling

- Introduction
- Cabling
- Overview of Cables
- Cabling Installation
- Cable Layout Architectures
- Cable Management
- Managing Cables
- Cable Maintenance Practices

##### Module 5 – Fundamentals of cooling II

- Introduction
- Cooling Related Devices
- Humidity and Static Electricity
- Nature of Humidity
- Humidity Control in Data Center
- Relative Humidity Control
- Dew Point Control
- Humidification System
- Converted Office Space
- OSP's
- Short Cycling

##### Module 7 – Fundamentals of Power

- Introduction
- Key Terms
- Electrical Load
- Power Types
- Power Factors
- Power System Failures
- Circuit Breakers and Outlets
- Physical security measures
- Power Distribution Components

##### Module 9 – Cooling Layouts for Data Center

- Introduction
- Types of Cooling System
- Air Distribution System
- Data Center Heat Removal Approaches
- Air Cooled Self-Contained Systems
- Water Systems
- Mounting Types
- Cooling Arrangements
- Technology Compaction
- Rack Arrangements

##### Module 11 – Power Distribution I

- Introduction
- Power Transmission Overview
- Nominal Vs Normal Voltage
- Transformer
- Type of Transformers
- Service Entrance
- Main Electrical Service Panel
- Facility Transformers
- Sub-Panels
- Feeders
- Branch Circuits
- Receptacles

##### Module 13 – Rack Fundamentals

- Introduction
- The 19 Inch Standard
- Earthquake Standards
- Open Frame Rack
- Advantages and Disadvantages of Open Frames
- Server Enclosure
- Networking Enclosure
- Seismic Enclosure
- Wall Mount Enclosure
- Industry Survey Results
- Lifecycle Costs
- Availability
- Improving Airflow: Door Ventilation
- Improving Airflow: Blanking Panels
- Improving Airflow: ADU
- Improving Airflow: SADU
- Improving Airflow: ARU
- Maintenance and Serviceability
- Adaptability and Scalability
- Manageability
- Floor Plan

##### Module 2 – Examining Fire protection

- Introduction
- National Fire Protection Association
- Prevention
- System Objectives of Data Center Fire Protection System
- Fire Triangle
- Classes of Fire
- Stages of Combustion
- Fire Detection Devices
- Smoke Detectors
- ISTD
- Fire Extinguishers
- Methods of Fire Suppression
- Water Sprinkler System
- Water Mist Suppression System

##### Module 4 – Fundamentals of Cooling I

- Introduction
- Evolution
- Data Center Cooling
- Physics of Cooling
- Heat Transfer Methods
- Airflow in IT Spaces
- Heat Generation
- Gas Law
- Evaporation
- Compression
- Condensation
- Expansion
- Evaporator

##### Module 6 – Fundamentals of Security

- Physical Security
- Identifying assets
- Physical Security Identification Methods and Devices
- Other Physical Security Methods
- Overall Considerations for Physical Security
- Control Access
- Risk Tolerance versus Cost
- Evaluation

##### Module 8 – Generator Management

- Identifying Main Components
- Standby Generators
- Internal Combustion Engine
- Filters
- Grounding
- Voltage Regulator
- Regulations
- Switchgear and Distribution
- Maintenance Measures

##### Module 10 – Power Redundancy in the Data Center

- Introduction
- UPS
- Types of UPS
- Standby UPS
- Line Interactive UPS
- Standby-Ferro UPS
- Double Conversion On-Line UPS
- Delta Conversion On-Line
- UPS System Design Configuration
- The Concept of "N"
- Types of Redundancies
- UPS Rightsizing
- Power Environments
- Standby Generators

##### Module 12 – Physical Infrastructure

- What is Management?
- Physical Infrastructure Management Challenges
- Incident Management
- Availability Management
- Capacity Management
- Physical Infrastructure Management Strategy
- Management Focus
- Physical Infrastructure Management Standards
- Management Approaches
- Element Managers
- Enterprise Management System
- Building Management System
- Integrating Physical Infrastructure Management
- Physical Infrastructure Element Manager

##### Module 14 – Cooling System

- Introduction
- Rack based Cooling
- Room based Cooling
- Row based Cooling
- Hybrid Cooling