

Data Centre Operational Management

DCOM-10

Lesson plan

Session	Contents	Class activities
Introduction Day 1 0900 -1000	<ul style="list-style-type: none"> ➤ Introduction to the subject ➤ Why do data centres fail? A review of published data centre failure tables and Capitoline's own analysis of failure modes 	
Housekeeping Day 1 1000-1030	<ul style="list-style-type: none"> ➤ Keeping it clean ➤ 'Ordinary' cleaning and specialist cleaning ➤ Who does what? Assigning housekeeping and maintenance tasks to internal staff or external contractors ➤ Who do you call when things go wrong? ➤ Internal and external maintenance ➤ Statutory requirements for lighting, disabled access, fire alarm etc 	
Optimising equipment layouts Day 1 1045 - 1130	<ul style="list-style-type: none"> ➤ Ideal rack layouts and hot aisle/cold aisle models ➤ Optimising equipment layout within a rack ➤ Cabling: how not to make a mess ➤ Labelling and administration schemes, from paper to asset management software 	Exercise 1 What's wrong with this picture? Identifying faults in real examples.
Understanding the power flow Day 1 1130-11230	<ul style="list-style-type: none"> ➤ The energy train from mains input to the rack, in block diagram form ➤ Essential block diagram items e.g. generators, UPS, batteries, PDU etc ➤ N, N+1 and 2N models ➤ Amps, volts, kW, kVA and power factor ➤ Balancing your phases! ➤ Keeping power and data apart 	Exercise 2 <i>Biochem plc.</i> Solving the rack power and overheating problem
Building Management Systems and monitoring Day 1 1330-1430	<ul style="list-style-type: none"> ➤ What is a BMS? ➤ What should be monitored and when ➤ EU Code of conduct requirements ➤ Bringing it all together with a Control Room 	
Policies and procedures Day 1 1450 -1700	<ul style="list-style-type: none"> ➤ Defining the policies and procedures needed to run a successful data centre ➤ Asset register ➤ Visitor and security policy ➤ Integrated fire policy ➤ Building operational settings ➤ Critical alarms and settings ➤ Maintenance plans ➤ Incident management ➤ Call list ➤ Permit to work ➤ Site H&S manual ➤ Change control and work orders 	Class exercise List what are the critical alarms and settings in your data centre

	<ul style="list-style-type: none"> ➤ Fire cause and effect algorithm ➤ Staff and contractor proof of competence ➤ Risk assessment and audit ➤ Disaster recovery plan 	
Fire safety procedures Day 2 0900 -1030	<ul style="list-style-type: none"> ➤ Fire safety plans ➤ Fire detection methods ➤ Fire alarm methods ➤ Integrating fire, BMS, HVAC and power systems ➤ Fire suppression techniques ➤ Staff training and risk assessment 	
Physical security policies Day 2 1045 - 1230	<ul style="list-style-type: none"> ➤ TIA 942 security definitions ➤ British Government Policy framework ➤ BICSI 002 standard ➤ Payment Card Industry security standard ➤ Access control ➤ CCTV ➤ Visitor and security policy 	
Business Continuity and Disaster Recovery Day 2 1330 -1430	<ul style="list-style-type: none"> ➤ ISO 27000 series ➤ BS25777 ➤ NFPA 1600 ➤ Combining good design and procedures to ensure business continuity ➤ Defining DR requirements ➤ Defining a DR plan and rehearsing it ➤ Communicating with customers and stakeholders 	Exercise 3 What's wrong with this picture? Identifying business continuity issues in some real world examples
Final exam and feedback Day 2 1500 -1700		1500 -1700 Final exam



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Learning outcomes	Assessment criteria
1. Understand ideal layouts of racks and equipment within racks to minimise heat load problems	Demonstrate an ability to analyse poor layout examples and suggest improved layout models in a class exercise
2. Understand the basic of power distribution in a data centre and make simple calculations	Calculate some example power distribution problems and identify remedies in a class exercise
3. Understand how poor layout and procedures lead to serious business continuity issues in a data centre	Analyse some examples of bad practice and identify the business continuity problems in a class exercise
4. Understand that the basics of successful data centre operational management and identification of business continuity and disaster recovery issues	Obtain a mark of at least 60% in the multiple choice test of 40 questions