



Title:	Virtualisation Technologies APPROVED
Long Title:	Virtualisation Technologies
Module Code:	COMP7041
Duration:	1 Semester
Credits:	5
NFQ Level:	Intermediate
Field of Study:	Computer Science
Valid From:	Semester 1 - 2017/18 (September 2017)
Module Delivered in	3 programme(s)
Module Coordinator:	Sean McSweeney
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Module Description:	This module provides the student with core practical and theoretical skills and competencies in virtualisation. As part of this module the students will develop an understanding of the role of virtualisation in information technology (IT), its evolution, core technologies, models, key architectural components and the solutions that it offers to organisations.
Learning Outcomes	
<i>On successful completion of this module the learner will be able to:</i>	
LO1	Discuss the evolution of virtualisation and the influence that it has had on the provision of Information Technology (IT).
LO2	Analyse the virtualisation architecture and the components that are part of a modern enterprise environment.
LO3	Install and configure the hypervisor, tools, services and applications in a virtualisation architecture.
LO4	Evaluate Server and Desktop virtualisation technologies and how they can integrate in an enterprise virtual environment.
LO5	Appraise the security controls that are required to protect the virtual machine and also the hypervisor (hosted and bare metal).
Pre-requisite learning	
Module Recommendations <i>This is prior learning (or a practical skill) that is strongly recommended before enrolment in this module. You may enrol in this module if you have not acquired the recommended learning but you will have considerable difficulty in passing (i.e. achieving the learning outcomes of) the module. While the prior learning is expressed as named CIT module(s) it also allows for learning (in another module or modules) which is equivalent to the learning specified in the named module(s).</i>	
Incompatible Modules <i>These are modules which have learning outcomes that are too similar to the learning outcomes of this module. You may not earn additional credit for the same learning and therefore you may not enrol in this module if you have successfully completed any modules in the incompatible list.</i>	
No incompatible modules listed	
Co-requisite Modules	
No Co-requisite modules listed	
Requirements <i>This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed. You may not enrol on this module if you have not acquired the learning specified in this section.</i>	
No requirements listed	

Module Content & Assessment

Indicative Content

Evolution of Virtualisation and Virtualised Systems

The evolution of virtualisation from mainframes to the modern virtual machine. The drivers for the use of virtualised systems and the types of virtualisation.

The Virtual Machine & the Hypervisor

Definition of a virtual machine, the hypervisor architecture (hosted and bare metal) and its role in enabling multiple virtual machines to operate on a single physical system

Server and Desktop Virtualisation

The role and impact of server and desktop virtualisation in the organisation, how it creates mobility and flexibility for enterprise and end user computing.

Virtualisation in the Cloud environment

Virtualisation as a Cloud enabling technology, how it can assist cloud computing to provide applications and services at all layers (SaaS, PaaS and IaaS).

Virtualisation Security

Data protection, data storage, permissions, controls, protecting the virtual machine, its application, guest operating system and protecting the hypervisor.

Assessment Breakdown

	%
Course Work	50.00%
End of Module Formal Examination	50.00%

Course Work

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Short Answer Questions	Questions on Virtualisation Core Technologies and Components.	1,2,3	10.0	Week 6
Practical/Skills Evaluation	Skills assessment - installing the hypervisor, configuring of virtual storage and networking, building server and desktop virtual machines and configuring security permissions for user access.	2,3,4,5	40.0	Week 12

End of Module Formal Examination

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Formal Exam	End of Semester Formal Examination.	1,2,3,4,5	50.0	End-of-Semester

Reassessment Requirement

Repeat examination

Reassessment of this module will consist of a repeat examination. It is possible that there will also be a requirement to be reassessed in a coursework element.

The institute reserves the right to alter the nature and timings of assessment

Module Workload

Workload: Full Time				
<i>Workload Type</i>	<i>Workload Description</i>	<i>Hours</i>	<i>Frequency</i>	<i>Average Weekly Learner Workload</i>
Lecture	Lecture delivering theory underpinning learning outcomes.	2.0	Every Week	2.00
Lab	Lab to support learning outcomes.	2.0	Every Week	2.00
Independent & Directed Learning (Non-contact)	Independent Study.	3.0	Every Week	3.00
Total Hours				7.00
Total Weekly Learner Workload				7.00
Total Weekly Contact Hours				4.00

Workload: Part Time				
<i>Workload Type</i>	<i>Workload Description</i>	<i>Hours</i>	<i>Frequency</i>	<i>Average Weekly Learner Workload</i>
Lab	Lab to support learning outcomes.	2.0	Every Week	2.00
Lecture	Lecture delivering theory underpinning learning outcomes.	2.0	Every Week	2.00
Independent & Directed Learning (Non-contact)	Independent Study.	3.0	Every Week	3.00
Total Hours				7.00
Total Weekly Learner Workload				7.00
Total Weekly Contact Hours				4.00

Module Resources

Recommended Book Resources

- Matthew Portnoy 2012, *Virtualization Essentials*, 1st Ed., Sybex [ISBN: 9781118176719]
- Chris Wolf & Erick Halter 2005, *Virtualization From Desktop to The Enterprise*, 1st Ed., Apress [ISBN: 9781590594957]
- EMC Education Services 2014, *Information Storage Management*, 2nd Ed., Wiley [ISBN: 9781116094839]

Recommended Article/Paper Resources

- EMC White Paper 2008, *Virtualization - Current Benefits and Future potential*
<https://education.emc.com/academicalliance/student/Virtualization%20WP.pdf>
- Oracle White Paper 2010, *The Most Complete and Integrated Virtualization From Desktop to Datacenter*
<http://www.oracle.com/us/technologies/virtualization/virtualization-strategy-wp-183617.pdf>

Other Resources

- Website: *VMware Technical Whitepapers*
<http://www.vmware.com>
- Website: *Microsoft Hyper V Technical Documentation*
<https://technet.microsoft.com/>

Module Delivered in

Programme Code	Programme	Semester	Delivery
CR_KDNET_8	<u>Bachelor of Science (Honours) in Computer Systems</u>	4	Mandatory
CR_KITMN_8	<u>Bachelor of Science (Honours) in IT Management</u>	4	Mandatory
CR_KITSP_7	<u>Bachelor of Science in Information Technology</u>	4	Mandatory