Module Title: Hybrid Cloud Technology

Module Code:	
Credits:	10
Credit Level:	9
Corequisite Modules:	VSA
Prerequisite Modules:	IaC, E&DCN

Hours per Week	
Lectures	**2**
Tutorials	
Lab/Studio/Practicals	**2**
Independent Learning	**13**
Total	**17**

Description:

To provide the student with the theoretical and applied skills to use virtualization technology in an enterprise or data centre environment and to integrate with public cloud, both from the theoretical perspective and as an applied discipline.

Module Learning Outcomes:

On successful completion of this module the learner will be able to:

1. Construct a justification matrix for virtualization architecture selection and design.
2. Defend the selection of hardware/cloud platforms suited to the scale of business requirements.
3. Design and configure appropriate compute, network and storage virtualization strategies for specific purposes.
4. Prepare a plan for security, management and business continuity strategies suited to a virtualized infrastructure.
5. Evaluate and utilise SME, data centre and cloud scale management tools.

Indicative Content:

1. Hardware Platforms

- The hardware requirements for virtualization
- Server architecture
- Storage and virtualized storage
- Networks and virtualized networks
- Other infrastructure, remote management, KVM, power and cooling

2. Desktop Virtualization

- The hardware requirements for desktop virtualization
- Clones, snapshots, linked clones, exports
- Desktop virtual networking
- Building and maintaining VMs

3. Server Virtualization

- The Software-Defined Data Centre, platform technologies and choices, management tools
- Design, installation, implementation and management for SME/ME sites.
- Design, installation, implementation and management for Enterprise Data Centres
- Design, installation, implementation and management for Public Cloud integration
- Integrating security and infrastructure services
- Maintaining and updating an installation
- BC and DR

4. Virtualization, Storage and Networking

- Fault Tolerance and High Availability metrics and calculations
- Storage requirements for enterprise functionality
- Shared storage at the cluster level
- Live migration and optimization of services
- Clustering
- SDN, NFV, appliances as middles boxes, VXLAN
- Overlay/Underlay networks
- Virtual switches and orchestration

Module Assessment:

Coursework	100%
End of Semester Final Exam	%

Learning Outcome	Addressed by	
	Coursework	**End of Semester Final Exam**
1		
2		
3		
4		
5		
6		

Indicative Assessment

Element No	Weighting	Type	Description	Learning Outcome Assessed
1	25%	Written/Practical	The student is expected to design, build and document a solution for an SME on a single site.	1, 2, 3, 4
2	25%	Written/Practical	The student is expected to design, build and document a solution for an enterprise data centre(s).	1, 2, 3, 4
3	50%	Reports	The student will compile a concise summary of each week's work in a report format.	5

Resources:

Note: Learning resources may also be available on Blackboard.

Recommended Reading				
Author	**Year**	**Title**	**Publisher**	**ISBN**
Davis et. Al.	2021	VCP-DCV for vSphere 7.x (Exam 2V0-21.20) Official Cert Guide	Pearson	978-0135898192

Other Resources

The Institute's Brightspace VMWare subscription gives access to a wide range of courses to students.
Lecturers have access to VMWare Customer Connect Learning.
VSAN related material at https://cormachogan.com/, https://www.yellow-bricks.com/

Webography:

ACM Digital Library: https://dl.acm.org/

IEEE Explore Digital Library: https://ieeexplore.ieee.org/Xplore/home.jsp

National Standards Authority Ireland: https://www.nsai.ie/standards/

European Union Laws & Regulations: https://eur-lex.europa.eu/homepage.html

OASIS Open: https://www.oasis-open.org/