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Title: Virtualisation and Cloud Computing
Status: Definitive
Code: **6003SEQR** (129326)
Version Start Date: 01-08-2021

Owning School/Faculty: Computer Science and Mathematics
Teaching School/Faculty: Oryx Universal College WLL

Team	Leader
Gabor Kecskemeti	Y

Academic Level: FHEQ6 **Credit Value:** 20 **Total Delivered Hours:** 46
Total Learning Hours: 200 **Private Study:** 154

Delivery Options

Course typically offered: S2, Summer NS2 (S2 for Jan)

Component	Contact Hours
Lecture	11
Workshop	33

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Artefacts	AS1	Development and deployment of virtualised system	50	
Exam	AS2	Examination	50	2

Aims

To investigate the underpinnings of cloud computing, including familiarising the student with virtualisation techniques and the principles of distributed systems. To develop software applications that target cloud platforms; ensuring students understand differences and difficulties in platform deployment and management.

Learning Outcomes

After completing the module the student should be able to:

- 1 Develop scalable applications and deploy them on a group of virtualised or otherwise distributed platforms.
- 2 Configure and monitor virtual infrastructure for software deployment and operations.
- 3 Critically analyse the underlying principles of cloud computing, virtualisation and distributed systems.
- 4 Critically review common software architectural patterns and principles used to facilitate cloud, virtualised and distributed applications.

Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

Development and deployment	1	2
Examination	3	4

Outline Syllabus

Cloud computing and its enabling technologies

*– data centres, virtualisation, software defined architecture/infrastructure/*aaS*

Distributed systems, including:

-shared memory architectures vs. message passing systems

-uniformity of shared memory and impact: UMA, NUMA and COMA

-synchronous vs. asynchronous messaging and scalability

-distributed data stores; schemes and consistency models (e.g. ACID, BASE, CAP)

Virtualisation

-Of resources and systems; containers and VMs

-Types of virtualisation / types of hypervisor

Associated development and design paradigms:

-Service-oriented architectures

-Pipelining and message queues

Learning Activities

Didactic, lecture-based theory and applied examples.

Workshop activities exploring implementation and deployment challenges

Problem-based learning centred on coursework assignment tasks.

Notes

This module explores often overlooked yet key disciplines in modern computing

infrastructure. It serves to impart upon students both a conceptual and practical insight into three key disciplines, namely virtualisation, distributed and cloud computing. It neatly complements two associated modules at NQF6, namely Embedded Systems and Applied Data Science in providing students with a complete coverage of modern computing infrastructure.