Module: Cloud-Native Application Architecture 271

Module name:	Cloud-Native Application Architecture 271
Code:	CNA271
NQF level:	6
Type:	Core – Bachelor of Information Technology
Contact time:	48 hours
Structured time:	8 hours
Self-directed time:	54 hours
Notional hours:	110 hours
Credits:	11
Prerequisites:	None

Purpose

In this course, the student will learn about micro-service oriented architecture, and why it is well-suited to modern cloud environments which require short development and delivery cycles. Students will learn the characteristics of micro-services and they will be exposed to the components of a cloud-native application. The course concludes with the student decomposing a monolithic application into a cloud-native application.

Outcomes

Upon successful completion of this module, the student will be able to demonstrate:

- Detailed knowledge of cloud-application architecture, including an understanding of and the ability to apply concepts of cloud-application engineering to cloud-native application design; and knowledge of distributed systems; and how that knowledge relates to the architecture of cloud-native applications.

- The ability to evaluate, select and apply appropriate techniques in particular to model application architecture that is distributable, scalable, multi-tenant and platform-independent.

- The ability to evaluate and analyse existing applications for the purpose of designing and implementing application architecture that is compatible with the cloud.

Assessment

Assessment is performed using a variety of instruments:

- Continuous evaluation of theoretical work through written assignment, formative, and summative test.
- Final assessment through a written examination.

Teaching and Learning

Learning materials

Prescribed Book

Cloud-Native Application Architecture: IT Without Frontiers.

Additional Material
📕 To be advised

Learning activities

The teaching and learning activities consist of a combination of formal lectures on theoretical concepts, exercises and discussions. Three mandatory assignments must be completed during the course. The experiences and progress on these practical components form the content of class discussions.

Notional learning hours

Activity	Units	Contact Time	Structured Time	Self-Directed Time
Lecture		40.0		21.0
Formative feedback		8.0		
Assignment	3			9.0
Test	3		6.0	11.0
Exam	1		2.0	13.0
		48.0	**8.0**	**54.0**

Syllabus

- Cloud Engineering Trends
- Traditional vs. Micro-service systems architecture
- Components of a cloud-native application
    - DevOps
    - Containers
    - Continuous Integration
    - Micro-services
- Cloud-Native Application Architecture
    - Business logic
    - Caching
    - Aggregation
    - Message queues
    - API gateways
    - Backend resources
    - Discovery Services
    - Health and monitoring
- Decomposing monolithic applications