H8CADEV: Cloud Application Development

Module Code:	H8CADEV
Long Title	Cloud Application Development APPROVED
Title	Cloud Application Development
Module Level:	LEVEL 8
EQF Level:	6
EHEA Level:	First Cycle
Credits:	10
Module Coordinator:	
Module Author:	Alex Courtney
Departments:	School of Computing
Specifications of the qualifications and experience required of staff	Master's and/or PhD degree in computing or cognate discipline. May have industry experience also.

Learning Outcomes

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

#	Learning Outcome Description
LO1	Identify and apply web application frameworks and design patterns to cloud based solutions.
LO2	Demonstrate conceptual, technical and practical skills in the analysis, design, implementation and deployment of a SaaS application to a suitable Platform as a Service.
LO3	Demonstrate a clear understanding of Test-Driven Development, including Unit, Functional, Integration and System Testing.
LO4	Apply and evaluate continuous integration and delivery strategies to handle their application running in a cloud platform.

Dependencies

Module Recommendations

No recommendations listed

Co-requisite Modules

No Co-requisite modules listed

Entry requirements	Learners should have attained the knowledge, skills and competence gained from stage 3 of the BSc (Hons) in Computing.

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Module Content & Assessment

Indicative Content

Programming Language
Understanding programming language type. Programming fundamentals (from language syntax, variables, loops, conditionals through to data structures). Designing reusable code

Introduction to Cloud Computing
What is Cloud Computing?. Cloud Service Models (Infrastructure as a Service (IaaS), Platform as a Service (PaaS), Software as a Service (SaaS)). Cloud Deployment Models (public cloud, private cloud, community cloud, hybrid cloud). Main Cloud Services (e.g. compute, storage, databases); Examples of cloud services offered by different cloud providers (e.g. Amazon Web Services, Microsoft Azure, Google Cloud Platform, IBM Cloud)

Web Application Frameworks
Introduction to Web frameworks. Models (investigating abstraction support available through framework, constructing models and relationships between models, understanding validation supports). Views (exploring how views are rendered within chosen framework to support multiple outputs). Controllers (investigating how controllers orchestrate communication within the application). Dynamic content generation (in particular for CRUD functionality). Creating scheduled tasks

Design Patterns
Understanding the importance of Design Patterns, including their historical evolution. Creational Design Patterns. Structural Design Patterns. Behavioural Design Patterns

Test Driven Development
Understanding a test-driven development approach. Testing framework support within Web App Frameworks. Unit Testing. Functional Testing. Integration Testing. Systems Testing. Comparison of testing environments

Front-end development for SaaS applications
The Client Layer. Browser-Based Clients. Native Applications

Web Application Deployment
Investigate service level agreements. Deploying SaaS applications to Public Cloud platforms. Monitoring SaaS applications

Continuous Delivery
Vagrant Development Environments. Automatic IaaS provisioning. Fundamentals of managing services with Chef and Puppet. Maintaining systems using Chef and Puppet. Working with Docker Containers. Maintaining Docker Containers

Assessment Breakdown	%
Coursework	100.00%

Assessments

Full Time

Coursework

Assessment Type:	Formative Assessment	% of total:	Non-Marked
Assessment Date:	n/a	Outcome addressed:	1,2,3,4
Non-Marked:	Yes		

Assessment Description:
The formative assessment will consist of ongoing independent practical tasks in the form of designing and implementing different deliverables for a prototype SaaS application. Oral feedback will be provided throughout these activities.

Assessment Type:	Project	% of total:	100
Assessment Date:	n/a	Outcome addressed:	1,2,3,4
Non-Marked:	No		

Assessment Description:
The project will enable learners to design, implement, evaluate and deploy a SaaS application to a public Cloud platform.

No End of Module Assessment

No Workplace Assessment

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.

Reassessment Description
Coursework Only This module is reassessed solely on the basis of re-submitted coursework. There is no repeat written examination. Learners who fail this module will be afforded an opportunity to take the repeat module assessment where all learning outcomes will be assessed.

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Module Workload

Module Target Workload Hours 0 Hours

Workload: Full Time

Workload Type	Workload Description	Hours	Frequency	Average Weekly Learner Workload
Lecture	Classroom & Demonstrations (hours)	24	Every Week	24.00
Tutorial	Other hours (Practical/Tutorial)	36	Every Week	36.00
Independent Learning	Independent learning (hours)	190	Every Week	190.00
			Total Weekly Contact Hours	60.00

Module Resources

Recommended Book Resources

David A. Black,Joseph Leo. (2019), The Well-Grounded Rubyist, Manning Publications, p.584, [ISBN: 978-1617295218].

Bala Paranj. (2017), Test Driven Development in Ruby, Apress, p.244, [ISBN: 978-1484226377].

Supplementary Book Resources

Stephane Jourdan,Pierre Pomes. Infrastructure as Code (IAC) Cookbook, [ISBN: 978-1-78646-491-0].

Armando Fox,David Patterson. Engineering Software as a Service, [ISBN: 978-0984881246].

This module does not have any article/paper resources

This module does not have any other resources

Discussion Note: