

## Module 7: Cloud Computing

<b>Stage</b>	1					
<b>Semester</b>	2					
<b>Module Title</b>	Cloud Computing					
<b>Module Number</b>	7					
<b>Module Status</b>	Mandatory					
<b>Module ECTS Credits</b>	5					
<b>Module NFQ level</b>	9					
<b>Pre-Requisite Module Titles</b>	None					
<b>Co-Requisite Module Titles</b>	None					
<b>Capstone Module?</b>	No					
<b>List of Module Teaching Personnel</b>	Mr Barry Denby					
<b>Contact Hours</b>				<b>Non-contact Hours</b>		
<b>36</b>				<b>64</b>		
<b>Lecture</b>	<b>Practical</b>	<b>Tutorial</b>	<b>Seminar</b>	<b>Assignment</b>	<b>Placement</b>	<b>Independent Work</b>
18	18			30		34
<b>Allocation of Marks (Within the Module)</b>						
	<b>Continuous Assessment</b>	<b>Project</b>	<b>Practical</b>	<b>Final Examination</b>	<b>Total</b>	
<b>Percentage Contribution</b>	<b>50</b>			<b>50</b>	<b>100</b>	

### Intended Module Learning Outcomes

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

1. Identify problems with existing software development strategies as applied to web-design.
2. Employ alternative Agile Development Strategies.
3. Use standard components of Web 2.0 such as CSS, AJAX, COMET and Web Services.
4. Explain the architecture of the web.
5. Describe Cloud services, Infrastructure as a Service (IaaS), Platform as a Service (Paas), Software as a service (Saas)
6. Understand Service Oriented Architectures, SOAP, REST, XML-RPC, WSDL
7. Explain the role of virtualisation in the Cloud
8. Develop, deploy, and configure a Cloud application (e.g. EC2)

## **Module Objectives**

The module aims to introduce the learner to modern web based services, their architecture, design and implementation. The emergence of web-services in the Cloud has opened up the need for new approaches to software development and deployment. The wide-spread use of mobile applications (typically backed up by a cloud infrastructure which performs the heavy lifting) has also brought new challenges and opportunities. A significant part of the assessment involves the learner developing a web application, deploying it to the Cloud and configuring for and evaluating performance post installation. Assessment emphasises a collaborative group approach to equip the learners with the skills required to work in a successful agile software development team.

## **Module Curriculum**

### **New approaches to Software Development**

Critical review of traditional models of software engineering in a Web-driven environment / Performance demands in relation to Web and Mobile platforms / Agile Programming / Extreme Programming / Adaptive Software Development / SCRUM

### **Web Frameworks**

Django / Rails / Google App Engine / Suitable IDEs

### **Cloud Services**

Consuming and publishing Web Services / SOAP / REST / XML-RPC / WSDL / CSS / Javascript / AJAX / COMET / Levels of virtualisation (EC2 vs Azure vs AppEngine) / “Big Data” in the cloud (e.g. NoSQL DBs, HBase, BigTable)

### **Cloud Applications**

Overview of current Cloud offerings / Strengths and weaknesses of different approaches / How developing Cloud software differs from building regular software / Evaluating performance of deployed Cloud applications / Diagnostics - how to debug a deployed Cloud application. / Multi-vendor Cloud applications (e.g. AppEngine with S3 storage)

## 4 Reading Lists and other learning materials

### Recommended Reading

A Brief Guide to Cloud Computing	Barnett	Robinson	2010
Build Your Own Ajax Web Applications	Eernisse	SitePoint	2006
Programming Amazon EC2	Van Vliet, Paganelli	O'Reilly Media	2011
Code in the Cloud: Programming Google AppEngine	Chu-Carroll	Pragmatic Bookshelf	2011
Essential App Engine: Building High Performance Java Apps with Google App Engine	De Jonge	Addison-wesley	2011
Beginning Smartphone Web Development	Frederick, Lal	Springer-Verlag	2009
The Definitive Guide to Django: Web Development Done Right	Holovaty, Kaplan-Moss	Apress	2007
Agile Software Development, Principles, Patterns and Practices	Martin	Prentice-hall	2002
Cloud Computing Explained	Rhoton	Recursive Ltd	2011
Agile Web Development with Rails (4th Edition)	Ruby, Thomas, Hanson	Pragmatic Bookshelf	2011
Javascript: The Complete Reference	Schneider	McGraw-Hill	2004

Additional reading as recommended by lecturer, appropriate to topic and to each learner's area of research.

### Module Learning Environment

#### Accommodation

Lectures are carried out in class rooms / lecture halls in the College. Lab tutorials are carried out in computer labs throughout the Campus. All have the software required to deliver the programme.

#### Library

All learners have access to an extensive range of physical and electronic (remotely accessible) library resources. The library monitors and updates its resources on an on-going basis, in line with the College's Library Acquisition Policy. Lecturers update reading lists for this course on an annual basis as is the norm with all courses run by Griffith College.

## Module Teaching and Learning Strategy

The module is taught using a combination of lectures, demonstrations and tutorials. The demonstrations and tutorials focus on getting learners up to standard in practical application development. The lectures supply the necessary theoretical background. In a fast changing technology field learners are expected under guidance to engage in research in relation to the different technologies and products available.

## Module Assessment Strategy

This module is 50% continuous assessment and the other 50% is an examination. The full breakdown of module assessment is described in the following table

Element No.	Weighting	Type	Description	Learning Outcomes Assessed
1	20%	Assignment	This assignment will test the learners ability to understand cloud computing. This is an essay based assignment and will test the learner's understanding of the theoretical components of the course.	1, 2, 4, 7
2	30%	Assignment	This assignment will test the learners ability to produce a cloud application. They should be able to design and implement a full application that runs exclusively on the cloud and presents its results to the user through some interface.	2, 3, 6, 8
3	50%	Examination	Examination that tests the learners understanding of the theoretical material in the module.	all