



## BUSINESS SCHOOL

Course Outline 2019

### INFOSYS 735: SPECIAL TOPIC IN INFORMATION SYSTEMS CLOUD COMPUTING ARCHITECTURE (15 POINTS)

Semester 1 (1193)

#### Course prescription

Cloud Computing Architecture is designed to help students develop technical expertise in cloud computing and prepare them for the AWS Certified Solutions Architect –Associate certification exam. The course combines practical skills development with broader teaching that requires research and critical thinking skills to analyze concepts relating to cloud computing. The curriculum is delivered through instructor-led classes, knowledge assessments, hands-on labs, and a research report.

#### Course advice

Prerequisite: Any degree in Commerce, Science, or Engineering.

#### Goals of the course

The goals of the course are to introduce students to:

- Identify the value and benefits of cloud computing
- Make decisions based on recommended cloud architectural principles and best practices
- Understand methods and tools to maintain security and protect data in the cloud
- Identify cloud deployment and management options
- Design cloud infrastructure to be scalable, highly available and fault tolerant
- Automate the deployment of cloud resources

#### Learning outcomes (LO)

By the end of the course, it is expected that students will be able to:

#	Learning outcome	Graduate profile capability*
LO1	Assess the value and benefit of cloud computing services in the context of small to medium business organisations	1. Disciplinary knowledge and practice
LO2	Propose and make decisions based on recommended architectural principles and practices in cloud computing services	1. Disciplinary knowledge and practice
LO3	Critically analyze industry proposed cloud architectures with research informed literature	2. Critical thinking 3. Solution seeking

#	Learning outcome	Graduate profile capability*
		5a. Independence
LO4	Create event-drive scaling solutions to architect-ed cloud platform solutions	1. Disciplinary knowledge and practice 3. Solution seeking
LO5	Design architectures to decouple infrastructure and reduce inter-dependencies	1. Disciplinary knowledge and practice 3. Solution seeking
LO6	Value resilience of learning through completing assessment with solutions not readily available and value self-management of learning by setting your own longer term goal(s) such as attaining the AWS Certified Solutions Architect certification	5a Independence

\* See the graduate profile this course belongs to at the end of this course outline.

## Content outline

Week / Module	Topic	Relevant learning resources/activities	Assessment due this period
1	CP: Unit 1 1.01 What is Cloud Computing 1.02 Leveraging Cloud Computing 1.03 Cloud Economics	Creating an EC2 Instance with MS Windows	
2	CP: Unit 2 2.01 Compute, Storage & Networking Services 2.02 Security and IAM 2.03 Databases	Build your VPC and Launch a Web Server Working with EBS Introduction to AWS IAM	
3	2.04 Elasticity and Management CSA: Unit 3	Build your DB Server and interact with your DB using an App Scale and Load Balance your Architecture	
4	3.01 Review of AWS fundamentals 3.02 Designing your environment	Deploy a Web Application on AWS	CP Exam Certification
5	3.03 System Design for HA 3.04 Event-Driven Scaling	Making your Environment Highly Available	

Week / Module	Topic	Relevant learning resources/activities	Assessment due this period
6	3.05 Automating your Infrastructure 3.06 Decoupling Your Infrastructure	Using Notifications to Trigger AWS Lambda Creating an Amazon VPC with CloudFormation	Research Proposal
7	3.07 Designing Web-Scale Storage 3.08 Introducing the Well-Architected Framework		Lab Project 1
8	3.09 WAF-Security 3.10 WAF-Reliability	Caching Files with Amazon CloudFront	
9	3.11 WAF-Performance Efficiency 3.12 WAF-Cost Optimization	Implementing Serverless Architecture	
10	3.13 Troubleshooting	Multi-Region Failover with Route 53	Research Report
11	3.14 Design Principles and Sample Architectures	Using AWS Services to Enhance a Web Application	Lab Project 2
12	Review		Lab FINAL Practical

## Learning and teaching

The class will meet for three hours each week. Class time will be used for a combination of lectures and lab based exercises. In addition to attending classes, students should be prepared to spend at least another six hours per week on activities related to this course. These activities include carrying out the required readings, labs and research relevant to this course, and preparing for assessments and the FINAL lab and theory.

150 hours learning over a single semester including:

- 36 contact hours through lectures
- 12 contact hours through laboratories/tutorials
- 24 hours preparatory reading
- 78 hours of self-study

## Teaching staff

### Lecturers

Koro Tawa

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Office Hour: Tuesdays TBA

Dr David TJ Huang  
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Office Hour: TBA

### Coordinators and Tutors

TBA

### Learning resources

There is no textbook for this course. In lieu of a textbook, most of the required readings are included online and via the AWS Academy Portal. Other readings and supplemental material will be distributed in class as needed. Students are also advised to take advantage of the extensive software resources made available for this course.

This course makes extensive use of AWS Academy resources. Students will be enrolled into two AWS Academy Courses.

1. Academy Cloud Practitioner
2. Academy – Cloud Solutions Architect - Associate

These online AWS courses have the substantive lecture notes and lab activity resources used in the course.

As well as the two AWS Academy Courses mentioned above, students will also have access to an online lab environment in which to complete the lab activities.

### **IMPORTANT**

There is no prescribed textbook, and therefore no textbook cost for this course.

Students are required however to sit and pay for the external AWS CP certification exam, which is a must pass component of the course (see Assessment information section below)

### Assessment information

Assessment task	Weight %	Group and/or individual	Submission
CP Certification Exam	20	Individual	25/03 - 29/03
Lab Project 1	5	Individual	10/04
Lab Project 2	5	Individual	29/05
Research Report	20	Individual	22/05
Lab FINAL Practical	25	Individual	05/06
FINAL Exam (Theory)	25	Individual	

### Pass requirements

1. Students must pass the CP Certification Exam ( $\geq 70\%$ )
2. The total mark from all of the assessment tasks above, must be  $\geq 50\%$

## IMPORTANT NOTES

- Students who do not pass the CP Certification Exam will be awarded a DNC (Did Not Complete mark in the course)
- The CP Certification is an external exam, held in Auckland central, but not at the University of Auckland. Students who fail will be allowed 1 resit and this must be taken after the 14 day stand down time allocated for this assessment. If students fail or do not sit a second attempt, their mark will be a DNC.
- Students will need to pay for sitting the CP Certification Exam. The cost for the exam in 2018 was \$US50. If students need to resit the exam because they did not pass it on the 1<sup>st</sup> round, resitting will require another payment.
- Students need to consent to making their grade mark that is achieved from the CP Certification Exam available to the course. This will be recorded in Canvas grades with the same privacy and security considerations as all other Canvas Activity marks.

## Description of assessment tasks

Assessment task	Learning outcome to be assessed
CP Certification Exam	L01,L02,L04,L05,L06
Lab Project 1	L02,L04,L05,L06
Lab Project 2	L02,L04,L05,L06
Research Report	L01-L06
Lab Final Practical	L01,L02,L04,L05,L06
Final Exam (Theory)	L01,L02,L04,L05,L06

## Inclusive learning

Students are urged to discuss privately any impairment-related requirements face-to-face and/or in written form with the courses convenor/lecturer and/or tutor.

## Academic integrity

The University of Auckland will not tolerate cheating, or assisting others to cheat, and views cheating in coursework as a serious academic offence. The work that a student submits for grading must be the student's own work, reflecting his or her learning. Where work from other sources is used, it must be properly acknowledged and referenced. This requirement also applies to sources on the worldwide web. A student's assessed work may be reviewed against electronic source material using computerised detection to provide an electronic version of their work for computerised review.

## Student feedback

Student feedback is important to us and has been used to improve the course from semester to semester. This semester you may be asked to complete evaluations on the teaching of the course, both in lectures and in tutorials. Please note that you do not have to wait until these evaluations are conducted in order to provide feedback. If there is

something that you think we could improve then please let us know (via email or in person) as soon as possible.

### In the event of an unexpected disruption

We undertake to maintain the continuity and standard of teaching and learning in all your courses throughout the year. If there are unexpected disruptions, the University has contingency plans to ensure that access to your course continues and your assessment is fair, and not compromised. Some adjustments may need to be made in emergencies, In the event of a disruption, the University and your course coordinators will make every effort to provide you with up to date information via Canvas and the University website.

### Graduate profiles for INFOSYS735

This course has an intended audience from a number of programs and the graduate profiles of the two major programs are as follows.

#### Graduate profile for Master of Commerce

The following six themes represent the capabilities that the Business School seeks to foster in all of its graduates. The development of these capabilities does not come all at once, but rather is expected to build from year to year. Each course is not expected to contribute to all capabilities, but each course will have its own goals and learning outcomes that relate to the overall development of this profile.

#### Graduate Profile

1. **Disciplinary knowledge and practice**

Graduates will be able to apply highly specialised knowledge within the discipline to demonstrate an advanced awareness and understanding in a global context.

2. **Critical thinking**

Graduates will be able to analyse and evaluate the relevant literature, and design and develop scholarly arguments that demonstrate advanced and diverse thinking.

3. **Solution seeking**

Graduates will be able to creatively research and analyse complex issues, and develop innovative solutions.

4. **Communication and engagement**

Graduates will be able to engage, communicate, and collaborate with diverse groups using multiple formats and effectively address a range of professional and academic audiences.

5. **Independence and integrity**

Graduates will be able to demonstrate advanced independent thought, self-reflection, ethics, and integrity.

6. **Social and environmental responsibility**

Graduates will consider, in relation to their discipline, the potential significance of the principles underpinning both the Treaty of Waitangi and sustainability.

## MInfoTech Graduate Profile

Discipline knowledge	
1	Advanced knowledge and understanding of the theory and current practice in their specific area of IT specialisation.
2	An awareness of developments in IT and the impact of evolving technology on industry.
3	Advanced knowledge of the role of information technology in organisations and familiarity with processes underpinning development and provision of goods and services.
4	An understanding of the IT industry workplace norms.
General intellectual skills and capacities	
5	An ability to find information, and evaluate it critically. An ability to use, manage, present, and communicate information in English and/or Māori, including with the use of modern information technology terminology.
6	A level of numeracy and computational literacy which enables competent performance of functions expected of a science graduate, and an understanding of qualitative and quantitative information as required.
7	Personal and professional integrity, and respect for the ethics of research and scholarly activity.
8	An awareness of international and global dimensions of intellectual, political and economic activities, and of the distinctive qualities of Aotearoa/New Zealand.
Personal qualities	
9	An enthusiasm for ideas, discovery and learning, and intellectual curiosity as a basis for lifelong learning and for an informed contribution to society.
10	An ability to work independently, with the ability and self-discipline to plan and achieve personal and professional goals.
11	An ability to work collaboratively with others, interacting effectively and demonstrating respect for others and an appreciation of human and cultural diversity.
12	An ability to lead in the community, including a willingness to engage in constructive public discourse and accept social and civic responsibilities.