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South East Technological University

Module Descriptor

Automated Cloud Services (Computing and Mathematics)

Automated Cloud Services (A13482)

Short Title: Automated Cloud Services
Department: Computing and Mathematics
Credits: 5 **Level:** Intermediate

Description of Module / Aims

This is a practical module that requires the student to build, configure and manage the operating system and network infrastructure required for a typical cloud application environment.

Programmes

		stage/semester/status
	BSc (Hons) in Physics for Modern Technology (WD_KPHTE_B)	4 / 8 / E
COMP-0967	BSc (Hons) in Software Engineering (WD_KDEVP_BI)	3 / 6 / M
COMP-0967	BSc (Hons) in Software Systems Development (WD_KDEVP_B)	3 / 6 / M
COMP-0967	BSc in Applied Computing (WD_KCOMP_D)	3 / 6 / M
COMP-0967	BSc in Information Technology (WD_KINFT_D)	3 / 6 / M
COMP-0967	BSc in Software Systems Development (WD_KCOMC_D)	3 / 6 / M
	BEng (Hons) in Automation Engineering with Data Intelligence (WD_EAUTO_B)	4 / 8 / M

Indicative Content

- Cloud Computing Architectures and Services
- Public Cloud Services: Storage; Compute; Networking
- Introduction to Python Programming
- Cloud APIs – Python or similar
- Configuration of Multi-tier Application Infrastructure Services
- Virtual Private Clouds
- Web Application Architecture – Performance, Scaling, Load Balancing and Security
- Devops, Automation and scripting – using for example bash (advanced), Python, PowerShell, Chef, Ansible
- Network and Application Management and Monitoring

Learning Outcomes

On successful completion of this module, a student will be able to:

1. Develop, configure and manage essential network infrastructure and application services.
2. Deploy a network monitoring solution.
3. Develop scripts to assist in the management and automation of modern network services.
4. Appraise and apply principles of application performance, scalability, load balancing and security.
5. Compare and contrast the main technologies required to develop and manage Cloud based Application Infrastructure.

Learning and Teaching Methods

- The practical lab component will be delivered in one double lab session.
- Strong emphasis on practical laboratory exercises with extensive use made of virtualised environments.
- Self-directed learning.

Learning Modes

Learning Type	F/T Hours	P/T Hours
Lecture	12	6
Practical	36	18
Independent Learning	87	111

Assessment Methods

	Weighting	Outcomes Assessed
Continuous Assessment	100%	
Assignment	40%	1,3
Assignment	40%	1,2,3,4,5
In-Class Assessment	20%	3,4,5

Assessment Criteria

<40%: Unable to build and configure basic infrastructure services to meet assignment requirements. Unable to interpret and describe key concepts of the specific knowledge domains of Python, Cloud Application Infrastructure services and automation.

40%–49%: Can build and configure basic infrastructure services to meet assignment requirements. Be able to interpret and describe key concepts of the specific knowledge domains of Python, Cloud Application Infrastructure services and automation.

50%–59%: Can discuss key concepts of the specific knowledge domains covered above and ability to discover and integrate related knowledge into cloud based application architectures.

60%–69%: In addition, be able to solve problems within the specific knowledge domain(s) by experimenting with the appropriate skills and tools.

70%–100%: All the above to an excellent level. In addition, demonstrate a deep understanding of the building, deployment and management of a Multi-tier web application infrastructure.

Supplementary Material(s)

- "The Python Wiki." https://wiki.python.org/
- "boto: Python interface to Amazon Web Services." http://boto.readthedocs.org/en/latest/
- Amazon, A. *Getting started with AWS (eBook).* New York: Amazon, 2014.
- Morris, K. *Infrastructure as Code: Managing Servers in the Cloud.* 1st. New York: O'Reilly Media, 2016.

Requested Resources

- Computer Lab: BYOD Lab