

2024 / 25

School of Science and Computing

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🌐 [www.wit.ie/schools/science\\_computing](http://www.wit.ie/schools/science_computing)



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## Module Descriptor

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### Developer Operations (Computing and Mathematics)

# Developer Operations (A11302)

**Short Title:** Developer Operations  
**Department:** Computing and Mathematics  
**Credits:** 5  
**Level:** Advanced

## Description of Module / Aims

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

## Programmes

			stage/semester/status
COMP-0559	BSc (Hons) in Applied Computing (International) (WD_KACCM_BI)		3 / 5 / M
COMP-0559	BSc (Hons) in Applied Computing (WD_KACCM_B)		3 / 5 / M
COMP-0559	BSc (Hons) in Applied Computing (WD_KCOMP_B)		3 / 5 / M
COMP-0559	BSc (Hons) in Computer Forensics and Security (WD_KCOFO_B)		3 / 5 / M
COMP-0559	BSc (Hons) in Computer Science (WD_KCMSC_B)		3 / 5 / M
COMP-0559	BSc (Hons) in the Internet of Things (International) (WD_KINTT_BI)		3 / 5 / M
COMP-0522	Higher Diploma in Science in Computer Science (WD_KCOSC_G)		1 / 2 / M

## Indicative Content

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

## Learning Outcomes

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

1. Build, 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. Analyse 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 delivery in a 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	
Practical	36	
Independent Learning	87	

## Assessment Methods

	Weighting	Outcomes Assessed
Continuous Assessment	100%	
Assignment	40%	1,3
Assignment	40%	1,2,3,4,5
In-Class Assessment	20%	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, Amazon. *Getting started with AWS (eBook)*. NY: Amazon Web Services, 2014.
- Garnaat, M. *Python and AWS Cookbook*. 1st Ed. NY: O'Reilly, 2012.
- Kim, G., K. Behr and G. Spafford. *The Phoenix Project: A Novel about IT, DevOps, and Helping Your Business Win*. New York: IT Revolution Press, 2013.
- Loukides, M. *What is DevOps? (ebook)*. NY: O'Reilly, 2012.
- Morris, K. *Infrastructure as Code: Managing Servers in the Cloud*. 1st. New York: O'Reilly Media, 2016.

## Requested Resources

- Computer Lab: BYOD Lab