

Module: DevOps 361

Module name:	DevOps 361
Code:	DOP361
NQF level:	6
Type:	Elective – Diploma in Information Technology (Networking Speciality)
Contact time:	48 hours
Structured time:	6 hours
Self-directed time:	46 hours
Notional hours:	100 hours
Credits:	10
Prerequisites:	NWD361

Purpose

DevOps combines the words “development” and “operations,” and it refers to a collaborative approach to building applications. The goal of DevOps is to help a team work more efficiently by using the right tools and software development processes for the situation.

Outcomes

Upon successful completion of this module, the student will be able to:

- Demonstrate an informed understanding of DevOps principles and terminologies.
- Demonstrate the ability to evaluate, select, and apply appropriate methods, procedures, or techniques to build DevOps pipelines.
- Demonstrate the ability to evaluate, select, and apply appropriate methods, procedures, or techniques to install, configure and manage Jenkins, Tomcat, Git and Maven.
- Demonstrate the ability to build jobs and perform unit testing using Jenkins.
- Demonstrate the ability to make decisions and act appropriately on automated testing, deployment, and reporting.
- Demonstrate the ability to evaluate, select, and apply appropriate methods, procedures, or techniques to perform Server security and maintenance.

Assessment

Assessment is performed using a variety of instruments:

- Continuous evaluation of theoretical work through a written assignment, 1 formative test and a summative test.
- Continuous evaluation of project work, where the student must design, manage and report on the evaluation of testing methodologies and the selection of an appropriate methodology for a given scenario, justifying the choice made with well-formed arguments and evidence.
- Final assessment through an examination.
- The assignments or projects collectively will count 30% of your class mark.
- All tests will collectively account for 70% of your class mark.
- Your class mark contributes 30% towards your final mark for the subject, while the final assessment accounts for 70% of your final mark.

Teaching and Learning

Learning materials

Prescribed books (EBSCO)

- 📖 **Verona, J., Duffy, M. and Swartout, P., 2016. Learning DevOps: Continuously Deliver Better Software. Packt Publishing Ltd.**

Additional material

- 📖 **AXELROD, C. W. Engineering Safe and Secure Software Systems. Boston: Artech House, 2013. ISBN 9781608074723. Shimon Brathwaite. Cybersecurity Law : Protect Yourself and Your Customers. Business Expert Press; 2019**
- 📖 **Alan Calder. NIST Cybersecurity Framework : A Pocket Guide. ITGP; 2018**

Learning activities

Learning will be facilitated by the lecturer with student centred activities that involve problem-based learning where pupils are presented with challenges that replicate the situation in the real-world environment. One compulsory assignment and a project must be completed during this course. The progress made on these assignments and project will guide the class discussion.

Notional learning hours

Activity	Units	Contact Time	Structured Time	Self-Directed Time
Lecture		41.0		15.0
Formative feedback		5.0		
Project	1	2.0		7.0
Assignment	1			3.0
Test	2		4.0	9.0
Exam	1		2.0	12.0
		48.0	6.0	46.0

Syllabus

- Introduction to DevOps
- DevOps principles
- DevOps terminology
- DevOps pipeline
- Introduction to Jenkins
- Installation and setup of Jenkins
- Git, Tomcat, Maven setup
- Jenkins configuration and management
- Building jobs using Jenkins
- Unit testing using Jenkins
- Automated testing, deployment, and reporting
- Distributed builds

- Server security and maintenance
- Backup and remote testing.