

## Module: DevOps 361

<b>Module name:</b>	DevOps 361
<b>Code:</b>	DOP361
<b>NQF level:</b>	6
<b>Type:</b>	Elective – Diploma in Information Technology (Networking Speciality)
<b>Contact time:</b>	72 hours
<b>Structured time:</b>	12 hours
<b>Self-directed time:</b>	36 hours
<b>Notional hours:</b>	120 hours
<b>Credits:</b>	12
<b>Prerequisites:</b>	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 written assignments, formative tests, and a summative test.
- Continuous evaluation through tracking of progress, offering support, guidance and provision of constant stream of opportunities to prove mastery of subject material and pursuing more challenging work as they master the basics.
- Final assessment through an examination.

## 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. This will be achieved through a combination between presentation of theoretical concepts, guided exercises, group work and discussions during the module.

### Notional learning hours

Contact	Distance	Other	Type of learning activities	% Learning
y	y	n	Lectures (face-to-face, limited interaction or technologically mediated)	40%
y	y	n	Tutorials: individual groups	20%
n	y	n	Syndicate groups	10%
n	y	n	Independent self-study of standard texts and references (study guides, books, journal articles)	10%
n	y	n	Independent self-study of specially prepared materials (case studies, multi-media, etc.	20%

### 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.