



# Executive Summary

<b>Qualification</b>	Occupational Certificate: Software Engineer
<b>Purpose</b>	The purpose of this qualification is to prepare a learner to operate as a Software Engineer. Typical learners include school leavers, people with workplace experience who would like to formalise their training, and qualifying learners who have already been exposed to software development. Qualified learners will be able to research, analyse, and evaluate requirements for existing or new software applications and design, develop, deploy, test, and maintain software applications.
<b>Qualification ID</b>	119458
<b>NQF Level</b>	6
<b>Minimum Credits</b>	240
<b>Duration</b>	One to two years
<b>Field</b>	Physical, Mathematical, Computer, and Life Sciences
<b>Subfield</b>	Information Technology and Computer Sciences
<b>Quality Partner</b>	MICT SETA
<b>Entry Requirements</b>	NQF Level 4 qualification

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## Qualification Overview

This qualification covers the full value chain of a software engineer, from determining user needs to designing solutions, from deploying solutions to testing and maintaining software and source code.

Software engineers are crucial for modern society due to their role in developing, maintaining, and improving the software that powers our daily lives. They are essential for driving innovation, ensuring reliability, and improving efficiency across various industries.

The South African tech industry is experiencing strong growth, driving a high demand for software engineers. While the number of developers in South Africa is relatively low compared to the global market, the need for skilled engineers is particularly acute in industries like finance, healthcare, and retail, which are increasingly reliant on digital solutions.

Qualifying learners will be able to:

- Apply information gathering techniques
- Identify and recommend appropriate IT solutions
- Document system design
- Design and manipulate databases
- Develop software to add value to an organisation
- Test or debug source code

### The KLM Empowered Learning X Perience

**X Plore**

For each of the integrated learning blocks, learners explore content on their own before engaging with others. Guided by self-study plans and diagnostic self-assessment, they formulate their own insights to share.


**X Tend**

Workplace application assignments allow learners to put their new learning to use on the job. Under the guidance of mentors, and with access to performance and wellness support, learners hone their skills and add value.


**X Cite**

Learners receive a welcome letter and an X Perience Map detailing the flow of their qualification. An orientation session helps them to understand the benefits and career options linked to the qualification.


**X Change**

Learners attend facilitator-led sessions, either in class or online, to share their learning and refine their skills in a safe environment. Collaborative activities and peer feedback build learning synergy and allow learners to master specific skills.


**X Cel**

Each learner's progress is measured against assessment criteria through formative and summative assessment. Final examinations and presentations are used to obtain an accurate picture of overall understanding and mastery of the content.

## Qualification Outline

- The Occupational Certificate: Software Engineer is presented over SIX learning blocks - covering both Knowledge Modules (KM) and Practical Modules (PM).
- Workplace Experience Modules are completed throughout the learning journey and assessed every quarter.
- Formative and summative assessments are conducted at regular intervals to prepare learners for the External Integrated Summative Assessment (EISA).

### 1 INTRODUCTION TO SOFTWARE ENGINEERING (40 credits)

ID	Title	Level	Credits
KM-01	Software Engineering	6	20
KM-04	Fundamentals of Project Management in Relation to Software Engineering	5	5
KM-05	Digital and Business Mathematics	5	15

### 2 DOCUMENTING DESIGN (25 credits)

ID	Title	Level	Credits
PM-01	Document System Design	6	25

### 3 FUNDAMENTALS OF PROGRAMMING (20 credits)

ID	Title	Level	Credits
KM-02	Programming	6	20

### 4 APPLICATION DEPLOYMENT (25 credits)

ID	Title	Level	Credits
PM-03	Programme and Deploy Applications	6	25

### 5 DATABASE DESIGN AND MANIPULATION (20 credits)

ID	Title	Level	Credits
KM-03	Database Design and Information Systems	6	15
PM-02	Design and Manipulate Databases	5	5

### 6 SOFTWARE TESTING (15 credits)

ID	Title	Level	Credits
PM-04	Test or Debug Source Code to Meet Clients' Needs	5	15

## Work Experience Modules

The work experience modules give the learner an opportunity to perform the software engineering function under authentic working conditions and to develop confidence by working with a mentor. They also expose learners to the complexities of dealing with workplace demands, the pressures of work, and the dynamics of stakeholder management.

ID	Title	Level	Credits
WM-01	Software Design	6	30
WM-02	Database Design and Manipulation	5	20
WM-03	Software Development	6	30
WM-04	Software Testing	5	15

### *The Greatness Effect*

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