



251201-001-00-00-KM-04, Fundamentals of Project
Management in relation to Software Engineering,
NQF Level 5, Credits 5

LEARNER WORKBOOK
MODULE FOUR (4)

1.1. Document Version

Document Version	1.0
Date Published	
Publisher	

1.2. Document Change History

Date	Version	Initials	Description
	1.0		

Module #	251201-001-00-00-KM-04
NQF Level	5
Notional hours	50
Credit(s)	Cr 5
Occupational Code	251201
SAQA QUAL ID	119458
Qualification Title	Occupational Certificate: Software Engineer Level-6 (240 Credits).

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Purpose

The main focus of the learning in this knowledge module is to build an understanding of project concepts and participation within project management.

The learning will enable learners to demonstrate an understanding of:

- KM-04-KT01: Fundamentals of projects (40%)
- KM-04-KT02: Fundamentals of Project management (60%)

Entry Requirements

- NQF Level 4

Or

- Information Communication Technology related qualification

Or

- At least three years' experience in Software Development

Provider Accreditation Requirements for the Knowledge Module

Physical Requirements:

- Well-resourced, ventilated and illuminated training centre with adequate facilities in accordance with industry general practices including but not limited to: -
- A desk and chair for each learner
- Hygiene facilities with adequate capacity and privacy
- Fully functional Computer Laboratory with access to the internet
- Relatively current and relevant software

Human Resource Requirements:

- Facilitator / Learner ratio of not more than 1:25
- Facilitators should hold an ICT related qualification pertaining to software development
- Facilitators must have a minimum 2 years' relevant facilitation or work experience

Or

- Facilitators must have completed a facilitator course

Legal Requirements:

- Compliant with the relevant Legislations

Venue, Date and Time:

- Consult your facilitator should there be any changes to the venue, date and/or time.
- Refer to your timetable.

Assessments

Integrated Formative Assessment: The skills development provider will use the curriculum to guide them on the stipulated internal assessment criteria and weighting. They will also apply the scope of practical skills and applied knowledge as stipulated by the internal assessment criteria. This formative assessment leads to entrance into the integrated external summative assessment.

Integrated Summative Assessment: The external summative assessment will be conducted through integrated written exercises and evaluation of a project and/or assignment by registered assessors at accredited assessment centres. Integrated written assessment will be conducted within a day. Candidates will be given a project to develop a solution over a period of three weeks. The project will be presented to a panel of assessors for a maximum of 3 hours. The overall summative assessment, which includes presentation of the project as well as written assessment, will take place over 2 days.

PURPOSE OF THE QUALIFICATION

The purpose of this qualification is to prepare a learner to operate as a Software Engineer. A Software Engineer researches, analyses and evaluates requirements for existing or new software applications and designs, develops, deploys, tests within scope of work(debugs) and maintains software applications.

A qualified learner will be able to:

- Design software to meet clients' needs, (NQF Level 6)
- Design and manipulate databases, (NQF Level 6)
- Develop software to add value to the organisation, (NQF Level 6)
- Test or debug source code to ensure client's needs are met, (NQF Level 5)

QUALIFICATION RULES

This qualification is made up of the following compulsory Knowledge and Practical Skill Modules:

Knowledge Modules:

- 251201-001-00-00-KM-01, Software Engineering, NQF Level 6, Credits 20
- 251201-001-00-00-KM-02, Programming, NQF Level 6, Credits 20
- 251201-001-00-00-KM-03, Database design and Information Systems, NQF Level 6, Credits 15
- 251201-001-00-00-KM-04, Fundamentals of Project Management in relation to Software Engineering, NQF Level 5, Credits 5
- 251201-001-00-00-KM-05, Digital and Business Mathematics, NQF Level 5, Credits 15

Total number of credits for Knowledge Modules: 75

Practical Skill Modules:

- 251201-001-00-00-PM-01, Document system design, NQF Level 6, Credits 25
- 251201-001-00-00-PM-02, Design and Manipulate Databases, NQF Level 5, Credits 5
- 251201-001-00-00-PM-03, Program and deploy applications, NQF Level 6, Credits 25
- 251201-001-00-00-PM-04, Test or debug source code to ensure client's needs are met, NQF Level 5, Credits 15

Total number of credits for Practical Skill Modules: 70

Work Experience Modules:

- 251201-001-00-00-WM-01, Software design, NQF Level 6, Credits 30
- 251201-001-00-00-WM-02, Database design and manipulation, NQF Level 5, Credits 20
- 251201-001-00-00-WM-03, Software development, NQF Level 6, Credits 30
- 251201-001-00-00-WM-04, Software testing, NQF Level 5, Credits 15

Total number of credits for Work Experience Modules: 95

EXIT LEVEL OUTCOMES

1. Design software to meet clients' needs
2. Design and manipulate databases
3. Develop software to add value to the organisation
4. Test or debug source code

KM-04-KT01: Fundamentals of Projects (40%)

- Define a project with respect to characteristics, implementation and solutions.

We can look at a project as certain tasks that should be completed in a sequence to attain a certain outcome.

A project has a few characteristics, one of them being that a project should have a start and an end, although it can last for years, it should end.

It's only a project when it creates something new. It cannot be repeated in the same way. It's a once-of activity.

A project operates with boundaries like time, money, quality and functionality.

A project is not a process or business.

The boundaries of a project can be split into 4 categories: Resources, people, scope and schedule. This all depends on what to projects want to achieve and when it needs to be done. Everything a project produce is a deliverable. When the project is completed between al the boundaries, it's considered a success.

In a project we have a project life cycle.

Initiation: Understand the goals of the project, Outline the priorities, Consider the deadline and assess and prepare for the risks.

Planning: Outline the tasks, plan a timeline for when a task should be performed,

Execution: Execute the planned tasks accordingly.

Closure: Analyse all the steps that have been done to check the performance of the project.

Resolve any issues related to the project. Analyse results and make amendments if necessary.

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2. Explain how project management evolved

We can date back to as far as the pyramids if we want to worth projects, But the first structured ways of managing projects were during world war. Modern mass production and construction, particularly combined with war efforts, led to more ambitious projects. Project management was only considered as a skill not a profession until projects like the Manhattan project came and a more structured approach was necessary.

The modern project era began between 1958 to 1979; The role of projects was becoming more important. The space program was at its peak activity. Due to these techniques like the CPM and PERT continued to be developed. Until early 70's project management was still applied primarily applied in defense ,construction and aerospace industries .it wasn't yet seen as vital to managing successful projects. In the 70's it began to be applied more widely in other areas. The 70's also saw some tools we now consider essential.

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KM-04-KT02: Basics of Project management (60%)

- Explain how various project constraints interact with each other (cost, time constraints, quality and risk management)

In a project, you must balance these constraints to get the best results out of your project. You can't have the best quality, but you never meet your deadline. You must decide which one to sacrifice to maintain project alignment and functionality. The scope of the project influences time and money. If your scope grows, you must increase the time needed to complete the project and your budget for the project. Cost includes anything of financial value, usually project cost, salaries, cost of equipment, cost of facilities and repair costs. You need to manage your time in a project, it is essential for success. When you try to increase your timeline there will be consequences. Time elements in your project that can lead to constraints can usually be: Overall project timeline, hours worked on timeline, internal calendars and goalposts, time allotted for planning and strategy and number of project phases. These three constraints can be difficult to maneuver around each other without losing project quality.

Risks is unexpected occurrences in your project and could affect the resources needed and it can affect the quality of your project. which in return can then affect the time needed to complete your project and your budget.

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- Explain the importance of effective communication in the project management

Communication is very important in project management because it keeps each professional informed and on-task. Project managers should communicate with their team members to ensure success in their project .

The team should ask questions if they are unsure and be able to share their ideas to aid in the progress of the project.

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