

| Occupational Certificate: Software Engineer (NQF5)<br>Software Engineering (SOEN) |                                                                                                                            |
|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| Curriculum Code                                                                   | 251201001                                                                                                                  |
| SAQA Qualification ID                                                             | 119458                                                                                                                     |
| Intake / year                                                                     | 2-2025                                                                                                                     |
| Assessment Name                                                                   | Summative Assessment                                                                                                       |
| Module NQF Level                                                                  | 6                                                                                                                          |
| Credits                                                                           | 20                                                                                                                         |
| Open date and time                                                                | 29 August 2025 <ul style="list-style-type: none"><li>• <b>Section A: 09:45</b></li><li>• <b>Section B: 11:15</b></li></ul> |
| Close date and time                                                               | 29 August 2025 <ul style="list-style-type: none"><li>• <b>Section A: 11:15</b></li><li>• <b>Section B: 12:45</b></li></ul> |
| Assessment Total Marks                                                            | Section A = 70 (20% of total mark percentage)<br>Section B = 60 (30% of total mark percentage)                             |
| Pass percentage                                                                   | 65%                                                                                                                        |

| Lecturer Information |                    |
|----------------------|--------------------|
| Lecturer             | Thaveshan Govender |
| Lecturer E-mail      | thaveshang@aie.ac  |

### IMPORTANT NOTICE

**Before submitting your assessment, please ensure that it is signed and that all your personal details are accurately filled in the designated space below (Section in red). Work will not be accepted unless the required sections below are fully completed prior to submission, resulting in a 0% grade for this assessment.**

**The signature must be your valid handwritten signature and NOT your name and surname typed in the space provided.**

|                                    |                                                                                     |              |                  |
|------------------------------------|-------------------------------------------------------------------------------------|--------------|------------------|
| <b>Student Number:</b>             | <b>461476</b>                                                                       |              |                  |
| <b>Student name and surname:</b>   | <b>John Henry Herbst</b>                                                            | <b>Date:</b> | <b>9/28/2025</b> |
| <b>Student cell phone number:</b>  | <b>0604944665</b>                                                                   |              |                  |
| <b>Student Signature:</b>          |    |              |                  |
|                                    |                                                                                     |              |                  |
| <b>Lecturer name and surname:</b>  | <b>Thaveshan Govender</b>                                                           | <b>Date:</b> |                  |
| <b>Lecturer Signature:</b>         |  |              |                  |
| <b>Assessor name and surname:</b>  |                                                                                     | <b>Date:</b> |                  |
| <b>Assessor Signature:</b>         |                                                                                     |              |                  |
| <b>Moderator name and surname:</b> |                                                                                     | <b>Date:</b> |                  |
| <b>Moderator Signature:</b>        |                                                                                     |              |                  |

### Instructions to Candidates

1. Read each question carefully.
2. You must answer Section B below the space provided named "STUDENTANSWER". Once completed, the answer sheet, with your answers, must be converted to PDF and uploaded to the student portal. Make sure that all additional information is uploaded in a single Zipped folder.
3. QCTO students who achieve between 55-64% may have a further submission opportunity, subject to the departmental rules.
4. **NO LATE submissions will be accepted. (System will automatically close when due date and time is reached). If you encounter any difficulty with the student portal, immediately take a screenshot, log a ticket (attention support), and attach your assessment to the ticket.**
5. You must follow the departmental formatting guidelines.
6. You must write your name, surname, and student number on your script. A failure to do so will result in your script not being marked.
7. By submitting your answer sheet for marking, you declare the following:
  - a. You are familiar with the AIE's policies on academic dishonesty and plagiarism;
  - b. Your submitted is your own original work. Where you have made use of someone else's work, you have duly referenced such work making using of the APA style of referencing;
  - c. You have not allowed, and will not allow any other student to copy your work; and
  - d. You did not copy the work of another student.
8. Students that are dishonest will be subjected to disciplinary procedures.

### Assessment Objective/s:

The Summative assessment (Section A and B) will cover the following assessment topics:

| No | KM/KT number | KT Description                                       |
|----|--------------|------------------------------------------------------|
| 1. | KM01-KT0101  | Overview/ introduction of system analysis and design |
| 2. | KM01-KT0102  | System Planning                                      |
| 3. | KM01-KT0103  | System Analysis                                      |
| 4. | KM01-KT0104  | System Design                                        |
| 5. | KM01-KT0105  | System Documentation                                 |
| 6. | KM01-KT0201  | Software and System Testing Methodologies            |
| 7. | KM01-KT0202  | Software and System Testing Techniques               |
| 8. | KM01-KT0203  | Software and System Testing Documentation Procedures |
| 9. | KM01-KT0301  | System integration methodologies and processes       |
| 10 | KM01-KT0302  | System Deployment Methodologies and processes        |
| 11 | KM01-KT0303  | System Deployment and integration documentation      |
| 12 | KM01-KT0401  | System Maintenance Procedures                        |
| 13 | KM01-KT0402  | System Management Tools                              |

### Scope:

The primary aim of this module is to equip you with a comprehensive understanding of software engineering principles. By exploring systems analysis and design, software and system testing, system deployment and integration, and system management, you will gain the knowledge and skills needed to navigate the complexities of developing and maintaining software systems effectively.

### Technical Aspects:

Please verify that all pages are included when downloading this assessment by checking the page numbers at the bottom of the document.

Ensure the following font and size is used in this assessment

- a. Font: Arial
- b. Size: 12
- c. Font colour: Black

Save and upload the report as a .PDF (**No backgrounds**) with the following naming convention:

- a. StudentName\_ StudentSurname \_Student no\_ ModuleCode\_FA1

### Mark allocation for report

See Mark allocation sheet below

#### Question 1

(5)

| <i>KM No</i> | <i>KT No</i> | <i>KT Description</i>                                       |
|--------------|--------------|-------------------------------------------------------------|
| <i>01</i>    | <i>0101</i>  | <i>Overview/ introduction of system analysis and design</i> |

- a) Identify five (5) benefits of system analysis and design

[5]

#### **ANSWER**

**Allowing for better management of business changes**

**Improving Quality**

**Improving Usability**

**Improving Productivity and customer satisfaction**

**Identifying potential risks and threats**

Question 2

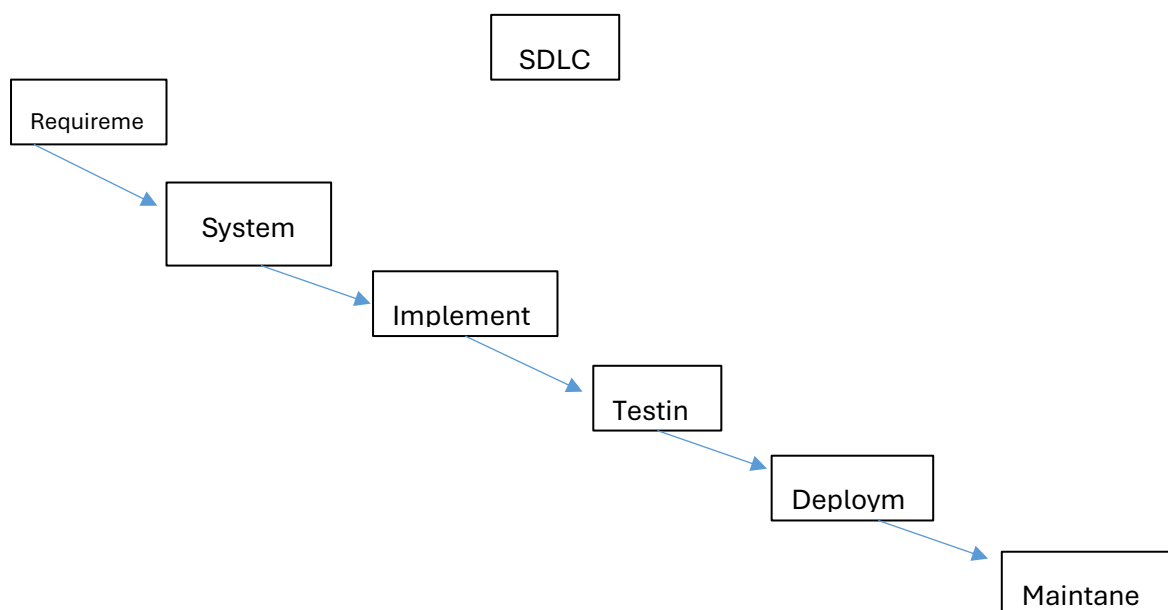
(7)

| <i>KM No</i> | <i>KT No</i> | <i>KT Description</i>  |
|--------------|--------------|------------------------|
| <i>01</i>    | <i>0102</i>  | <i>System Planning</i> |

a) Illustrate with the aid of a sketch the SDLC.

[7]

**ANSWER**



Question 3

(16)

| <i>KM No</i> | <i>KT No</i> | <i>KT Description</i>  |
|--------------|--------------|------------------------|
| <i>01</i>    | <i>0103</i>  | <i>System Analysis</i> |

a) Elaborate why systems analysis is important.

[16]

**ANSWER**

System Analysis Helps to make sure the system can meet user requirements; it also makes it intuitive and reliable. It does this by considering the program from the user's perspective and identifying issues early which allows for timely adjustments.

It Identifies functions deficiencies by dissecting system components and their interactions making it possible to detect flaws in functionality, logic or dataflow.

System Analysis helps with Evidence-based decision making. It Provides data and the rationale needed. By doing this It ensures solutions align with organizational goals and deliver measurable value.

System analysis is important for the successful design, implementation and Maintenance of efficient information systems.

#### Question 4

(16)

| <i>KM No</i> | <i>KT No</i> | <i>KT Description</i> |
|--------------|--------------|-----------------------|
| <i>01</i>    | <i>0105</i>  | <i>Viruses</i>        |

- a) According to Heidi Adkisson, Principal UX Designer & Partner at Blink UX, there [10]  
are many different design docs variants.

Identify and discuss five (5) of the more task-specific types.

#### **ANSWER**

User stories - Informal explanation of a software feature from the end users' point of view.

Use cases – Describes what the system will do, it can be a huge time saver downstream.

Scenario Narratives – Provides a more descriptive detail of how a set of tasks will be performed. Can be used as the basis for user testing.

Screen flow diagrams – Provides a schematic of how users can move screen-to-screen

Page level documentation – This explains what each button on every page will do.

- b) Identify six (6) purposes of system documentation.

[6]

#### **ANSWER**

- Provides reference material to support training and onboarding of system users and operators.
- Act as a development checkpoint for tracking progress and decision making.
- Simplify the migration of systems between platforms or environments
- Facilitate easier modification, upgrade and system integration efforts.
- Improves communication between developers, users and stakeholders.
- Enable advance planning by detailing expected system behaviors and system deliverables.

Question 5

(8)

| <i>KM No</i> | <i>KT No</i> | <i>KT Description</i>                            |
|--------------|--------------|--------------------------------------------------|
| <i>01</i>    | <i>0201</i>  | <i>Software and System Testing Methodologies</i> |

a) What is your understanding of what white box testing is?

[5]

#### **ANSWER**

**White box testing is when the testers do have prior knowledge of how the program functions and should function. It then runs tests to see if the programming is functioning this way. We do white box testing to ensure the program is running the way we intended it to run and it gives the expected outcome we want. It helps to spot some runtime errors and gives us a chance to fix it. We do white box testing to ensure the program is running the way we intended it to run and giving**

b) Identify three (3) main techniques included in white box testing.

[3]

#### **ANSWER**

Statement coverage

Branch coverage

Question 6

(8)

| <i>KM No</i> | <i>KT No</i> | <i>KT Description</i>                                                   |
|--------------|--------------|-------------------------------------------------------------------------|
| <i>01</i>    | <i>0203</i>  | <i>Software and System<br/>Testing<br/>Documentation<br/>Procedures</i> |

- a) Identify eight (8) benefits of using documentation.

[8]

**ANSWER**

**Clarifies the quality of methods and objectives**

**Ensures internal coordination when a costumer uses the software.**

**Ensures clarity about the stability of the tasks and performance.**

**It provides feedback on preventative tasks**

**It provides feedback for your planning cycle**

**It is also a time saving process because we can easily refer back to the text document.**

**Its consistent because we will test on the same value.**

**It creates objective evidence for the performance of the quality management system**

**Mark allocation for student**

| Question      | Maximum Mark | Learner mark |
|---------------|--------------|--------------|
| Question 1.a  | 5            |              |
| Question 2.a  | 7            |              |
| Question 3.a  | 16           |              |
| Question 4.a  | 10           |              |
| Question 4.b  | 6            |              |
| Question 5.a  | 5            |              |
| Question 5.b  | 3            |              |
| Question 6.a  | 8            |              |
|               |              |              |
| <b>Total:</b> | <b>60</b>    |              |

## STUDENT ASSESSMENT FEEDBACK

|                                   |                                                           |
|-----------------------------------|-----------------------------------------------------------|
| <b>Qualification Name:</b>        | <b>Occupational Certificate: Software Engineer (NQF5)</b> |
| <b>Qualification SAQA Number:</b> | <b>119458</b>                                             |
| <b>Subject Name:</b>              | <b>Software Engineering</b>                               |
| <b>Subject Code:</b>              | <b>SOEN</b>                                               |
| <b>Assessment Name:</b>           | <b>Summative Assessment</b>                               |
| <b>Assessment Code:</b>           | <b>SOEN_SA</b>                                            |

|                            |                  |  |                          |  |
|----------------------------|------------------|--|--------------------------|--|
| <b>Assessment Decision</b> | <b>Competent</b> |  | <b>Not yet competent</b> |  |
|----------------------------|------------------|--|--------------------------|--|

| <b>Feedback report</b>         | <b>1st Attempt</b> |            | <b>2nd Attempt</b> |            |
|--------------------------------|--------------------|------------|--------------------|------------|
|                                | <b>C</b>           | <b>NYC</b> | <b>C</b>           | <b>NYC</b> |
| <b>Unit standard Number(s)</b> |                    |            |                    |            |
| <b>KM01</b>                    |                    |            |                    |            |
| KT0101                         |                    |            |                    |            |
| KT0102                         |                    |            |                    |            |
| KT0103                         |                    |            |                    |            |
| KT0104                         |                    |            |                    |            |
| KT0105                         |                    |            |                    |            |
| KT0202                         |                    |            |                    |            |
| KT0203                         |                    |            |                    |            |
| KT0301                         |                    |            |                    |            |
| KT0302                         |                    |            |                    |            |

|        |  |  |  |  |
|--------|--|--|--|--|
| KT0303 |  |  |  |  |
| KT0401 |  |  |  |  |
| KT0402 |  |  |  |  |
|        |  |  |  |  |

|                                                                                                     |
|-----------------------------------------------------------------------------------------------------|
| <b>General feedback to learner</b><br><b>Supply comprehensive feedback why learner is found NYC</b> |
|                                                                                                     |
|                                                                                                     |
|                                                                                                     |
|                                                                                                     |
|                                                                                                     |