



Artificial Intelligence Software Developer

Course Information

Occupational Qualification: Artificial Intelligence Software Developer

Qualification Information

Level	SAQA ID	Credits
NQF 5	118792	209

Entry Requirements:

- NQF Level 4

Occupational Purpose

The purpose of this qualification is to prepare a learner to operate as an Artificial Intelligence Software Developer. Artificial Intelligence Developers build AI functionality into software applications through integrating and implementing AI algorithms and logic into the deliverables of an IT project. Developers teach the machine to solve problems the way a human would through the use of programming. They create, test, and deploy code. These developers also assist in converting machine learning APIs so that other applications can use them.

Occupational Tasks:

- Interpret solution design documentation and develop AI solution
- Train the AI model through a machine learning process and test the performance to ensure that model accuracy is strictly maintained within the selection framework
- Deploy the AI solution and maintain the solution to ensure model accuracy is strictly maintained

Assessments

- Formative assessment activities during the course of each module.
- Summative assessments at the end of each module
- An External Integrated Summative Assessment (EISA) at the end of the qualification.

NB: Access to the EISA is dependent on the successful of all qualification deliverables and formative and summative assessment at IQ.

Knowledge, Practical and Workplace Modules comprise the following competencies.

Knowledge Experience Module	Level	Credits
Overview of Artificial Intelligence	4	2
Introduction to Mathematics and Statistics	4	10
Analytical Thinking and Problem Solving	4	3
Data, Databases and Data Visualisation	4	8
Computing Theory	4	8
Introduction to Artificial Intelligence, Machine Learning, Deep Learning	4	5
Artificial Intelligence	5	12
Machine Learning	5	16
Deep Learning	5	16
Introduction to Governance, Legislation and Ethics	4	1
Fundamentals of Design Thinking and Innovation	4	1
4IR and Future Skills	4	4

Practical Module	Level	Credits
Mathematics and Statistics for Programming	4	8
Problem Definition, Analytical Thinking and Decision-Making	4	2
Access, Analyse and Visualise Structured Data Using Spreadsheets	4	4
Use SQL to Communicate with a Database	5	4
Build a simple AI solution using Python	5	8
Use Python Data Scraping to Populate Database Table in SQL	5	4
Use Machine Learning to Build an AI solution in Python	5	6
Use Deep Learning to Build an AI Neural Network Architecture in Python	5	10
Use Deep Learning to Build an AI Neural Network Architecture in TensorFlow	5	10
Function Ethically and Effectively as a Member of a Multidisciplinary Team	4	3
Participate in a Design Thinking for Innovation Workshop	4	4

Workplace Modules	Level	Credits
AI Solution Design Interpretation and Development	5	20
AI Solution Performance Testing	5	20
AI Solution Deployment, Modification and Improvement	5	20

Introduction to AI	4	40%
Background to AI	4	20%
Strategic advantage of AI in business	4	40%

Knowledge Module 02

Basic Mathematics	4	20%
Linear Algebra	4	10%
Conversion between decimal and binary systems	4	5%
Expressing size and magnitude	4	5%
Error in calculations	4	5%
Cartesian coordinate system	4	5%
Pythagorean theorem	4	5%
Increments	4	5%
Calculus	4	5%
Probabilities	4	5%
Statistics	4	5%
Bayes' Theorem	4	5%

Knowledge Module 03

Introduction to analytical thinking	4	140%
Problem solving and critical thinking	4	40%
AI problem solving	4	20%

Knowledge Module 04

Introduction to data	4	20%
Data in spreadsheets	4	20%
Data analytics	4	10%
Introduction to databases	4	15%
Data mining	4	15%
Structured query language (SQL)	4	5%
Visualising data with AI tools	4	5%
Data security	4	5%

Knowledge Module 05

Introduction to programming languages	4	25%
Introduction to algorithms	4	25%
Programming basics	4	20%
Solution development	4	15%
Introduction to Python	4	15%

Knowledge Module 06

Artificial Intelligence (AI) vs Machine Learning (ML) vs Deep Learning (DL)	4	100%
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Knowledge Module 07

AI frameworks	4	50%
Using AI for data scraping	4	50%

Knowledge Module 08

Types of ML models	4	20%
ML algorithm classification	4	20%
Common ML algorithms	4	30%
ML Workflow Process (Framework)	4	10%
Business benefits of ML	4	20%

Knowledge Module 09

Deep Learning (DL)	4	40%
Advance Python for Deep Learning	4	25%
TensorFlow and Keras for Deep Learning	4	35%

Knowledge Module 10

Deep Learning (DL)	4	40%
Advance Python for Deep Learning	4	25%
TensorFlow and Keras for Deep Learning	4	35%

Knowledge Module 10

Governance	4	20%
Legislation governing workplaces	4	15%
Introduction to ethics and security	4	5%
Ethics at work	4	14%
Security	4	15%
Performance management	4	10%
Business planning	4	7%
Costing of products	4	7%
Resources	4	7%

Knowledge Module 11

Introduction to design thinking	4	15%
The human element	4	10%
Creativity	4	20%
Innovation	4	20%
Design	4	10%
Design thinking methodology	4	10%
Application of design thinking	4	15%

Knowledge Module 12

Knowledge Modules Breakdown

4 IR emerging trends	4	10%
Computing Knowledge	4	7%
Future skills and competencies (4IR)	4	10%
4 IR trends affecting businesses	4	10%
Interpersonal skills	4	5%
Intrapersonal skills	4	5%
Communication principles and methods	4	5%
Written business communication	4	7%
Presentation skills	4	7%
Teamwork in the workplace	4	10%
Committees and meetings	4	5%
Job descriptions and profiles	4	5%
Customers and stakeholders	4	7%
Customer service	4	7%

Practical Module 01

Apply basic mathematics	4
Apply linear algebra	4
Convert decimal into binary systems	4

Express size and magnitude	4	Credits 8
Fix errors in calculations	4	
Apply Cartesian coordinate system	4	
Apply Pythagorean theorem	4	
Use increments	4	
Use calculus	4	
Use probabilities	4	
Apply statistical calculations	4	
Apply Bayes' Theorem	4	

Practical Module 02

Apply analytical thinking skills	4	Credits 2
Apply problem solving and critical thinking skills	4	
AI Problem Solving	4	

Practical Module 03

Source, refine, clean and analyse data	4	Credits 4
Analyse and visualise data using Spreadsheets	4	
Analyse and report data presented in a database	4	
Use data mining to source and present data	4	
Visualising data with AI tools	4	

Practical Module 04

Apply Structured Query Language (SQL) to perform a database transaction

Credits
4

Practical Module 05

Install Python on a PC

Identify a problem

Prepare data

Choose AI Learning category

Train model

Select an ML system

Run AI implementation

Credits
8

Practical Module 06

Apply Python to scrape data in a database using Structured Query Language (SQL)

Credits
4

Practical Module 07

Identify a problem

Prepare data

Choose AI Learning category

Train model

Select an ML system

Run AI implementation

Turn prototype solution into an economically viable product

Credits
6



Practical Module 08

Identify a problem		Credits 10
Prepare data		
Choose AI Learning category		
Train model		
Select an ML system		
Run AI implementation		
Turn prototype solution into an economically viable product		

Practical Module 09

Identify a problem		Credits 10
Prepare data		
Choose AI Learning category		
Train model		
Select an ML system		
Run AI implementation		
Turn prototype solution into an economically viable product		

Practical Module 10

Present information to an audience		Credits 10
Conduct basic research (gather and explore data and information) on 4IR skills and application opportunities in the workplace		
Ensure compliance with the code of conduct and governance in the workplace		
Collaborate with team members in the workplace		
Attend and participate in meetings		

Practical Module 11

Collaborate with team members to apply innovative and problem-solving strategies		Credits 4
Apply design thinking process to solve a problem creatively and innovatively		

Workplace Modules

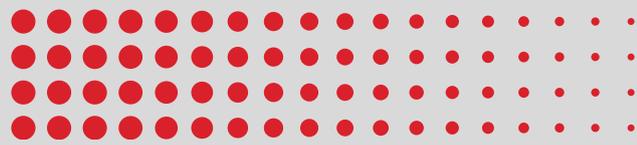
Attend induction program and familiarise self with company processes, procedures, tools and culture		Credits 20
Scrape data using a suitable tool e.g., SQL		
Review existing AI solutions		
Analyse the SDD for the AI solution and prepare the technical design documentation		
Scrape and analyse data for application		
Develop smarter, friendlier and more sensitive AI solutions in accordance with the design documents and company quality standards, applying best practices		

Workplace Modules

Assist with the preparation of test cases for the AI solution		Credits 20
Take remedial action to address any exception from the desired outcomes		
Resolve workflow incidents related to the AI solution through troubleshooting and fixing bugs		

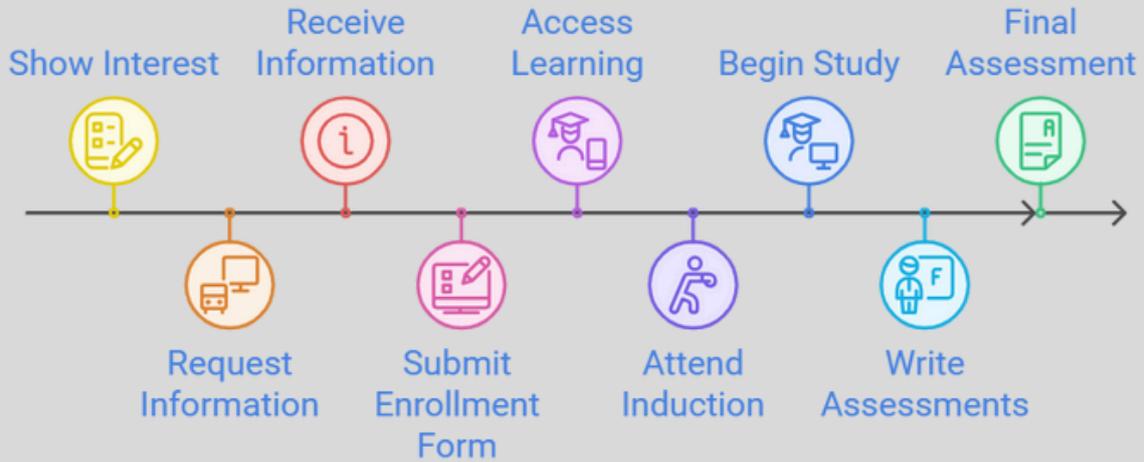
Workplace Modules

Assist the team to deploy the AI solution		Credits 20
Investigate opportunities for the modification and improvement of the AI solution		
Maintain and update the AI solution to incorporate improvements and changes		



Customer Journey

Enrollment and Completion Process for IQ Programmes



IQ Commitment

Our Commitment to Your Success: Responsibilities to Our Learners from Enrolment

- Seamless Onboarding & Personalised Support
- Flexible, Engaging Learning
- Continuous Communication & Unrivalled Support
- Tailored Learning Paths & Career Development
- Recognition of Prior Learning
- Innovative Assessments & Real-World Learning
- Lifelong Learning & Alumni Support

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