



Data Science Practitioner

Course Information

2024 - 2025

Qualification Information

Occupational Qualification: Data Science Practitioner

Level	SAQA ID	Credits
NQF 5	118708	185

Entry Requirements:

- NQF Level 4

Occupational Purpose

Data Science Practitioners take custody of data and make the data available in a structured form for the Data Scientist to use. They support the data life cycle by collecting, transforming, and analysing data, and communicating results in order to solve elementary business problems. They transform data into robust, comprehensive data sets, aligned with the problem identified in the statement of work and ready for storage.

Occupational Tasks:

- Collect large amounts of structured and unstructured data from primary and secondary sources and extract and transform them into a usable format.
- Apply data analysis techniques to uncover patterns and trends in datasets (resultant sets of data that can be viewed as tables or as a "spreadsheet of data") to solve business-related problems.
- Prepare and present descriptive analytics reports on patterns and trends using computer programming languages and explain those patterns and trends through e.g., visualisation, storytelling etc. using data visualization tools.

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
Introduction to Data Science and Data Analysis	4	6
Logical Thinking and Basic Calculations: Refresher	4	4
Computers and Computing Systems	4	4
Computing Theory	4	2
Basic Statistics for Data Analytics	4	10
Statistics Essentials for Data Analytics	5	4
Data Science and Data Analysis	5	12
Data Analysis and Visualisation	5	16
Introduction to Governance, Legislation and Ethics	4	3
Fundamentals of Design Thinking and Innovation	4	4
4IR and Future Skills	4	1

Practical Module	Level	Credits
Apply Logical Thinking and Maths Refresher	4	3
Apply Code to Use a Software Toolkit/Platform in the Field of Study or Employment	4	4
Use Spreadsheets to Analyse and Visualise Data	4	3
Use a Visual Analytics Platform to Analyse and Visualise Data	5	4
Apply Statistical Tools and Techniques	5	4
Collect and Pre-Process Large Amounts of Unruly Data	5	12
Apply Data Analysis Techniques to Uncover Patterns and Trends in Datasets	5	12
Prepare and Present Descriptive Analytic Reports for Decision Making	5	12
Participate in a Design Thinking for Innovation Workshop	5	3
Collaborate Ethically and Effectively in the Workplace	5	2
Workplace Modules	Level	Credits
Data Collection and Pre-processing Processes	5	16
Statistical Data Analysis Processes	5	16
Data visualisation and Reporting Processes	5	16
Capstone Project Using an Appropriate Toolkit	5	16

Knowledge Module 01

What is data science?	4	15%
Why data science?	4	10%
Sources of data	4	10%
Ensuring access to accurate data	4	20%
Applications of data science	4	15%
Attributes of a Data Science Practitioner	4	20%
Big Data	4	10%

Knowledge Module 02

Mathematical thinking skills for problem solving	4	15%
Conversion between decimal and binary systems	4	5%
Expressing size and magnitude	4	5%
Error in calculations	4	10%
Cartesian coordinate system	4	10%
Pythagorean theorem for finding the distance between two points	4	5%
Operator precedence	4	10%
Integer division	4	10%
Modulus	4	10%
Increments	4	10%
Mixing types	4	10%

Problem solving skills for IT Professionals	4	10%
Input and output devices	4	5%
Installing printers	4	5%
Mobile devices, multimedia, and laptop computers	4	5%
Preventative maintenance	4	5%
Troubleshooting procedures	4	5%
Introduction to operating systems	4	10%
Managing files	4	5%
Applications utility, troubleshooting and optimization	4	10%
Introduction to networking and wireless connections	4	10%
Introduction to recovery	4	5%
Cloud computing	4	10%
Security fundamentals	4	10%
Programming and development	4	5%

Knowledge Module 04

Introduction to programming languages	4	30%
Programming basics	4	40%
Software applications	4	30%

Mean	4	25%
Standard deviation	4	25%
Regression	4	25%
Sample size determination	4	25%

Knowledge Module 06

Sample or population data	5	2%
Fundamentals of descriptive statistics	5	7%
Measures	5	7%
Distributions	5	7%
Estimators and Estimates	5	7%
Confidence intervals advanced topics	5	3%
Hypothesis testing	5	15%
Fundamentals of regression analysis	5	13%
Subtleties of regression analysis	5	13%
Categorical data	5	5%
Classification	5	10%
Clustering	5	4%
Association	5	7%

Data science	5	15%
Approaches in data analysis	5	25%
Data quality	5	10%
Best practices for data governance	5	10%
Legislation (e.g. POPI Act)	5	40%

Knowledge Module 08

Introduction to Business Analytics	5	5%
Introduction to business processes, analysis and process modelling	5	20%
Introduction to Data Science Programs	5	5%
Data Analytics	5	15%
Wrangling	5	10%
Data Structures	5	5%
Data Visualization	5	5%
High-throughput	5	15%
High-dimensional data analysis	5	10%
Basic machine learning and artificial intelligence concepts	5	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 10

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 11

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%

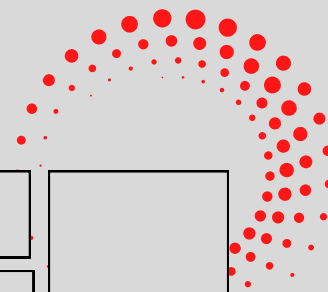
Practical Module 01

Practical Modules Breakdown

Number bases and measurement units	4	Credits 3
Basic math	4	
Operator precedence	4	
Integer division	4	
Functions, limits and continuity	4	
Differential calculus of single variable functions	4	
Modulus	4	
Increments	4	
Mixing types	4	
Casting (timing and contextualising)	4	

Practical Module 02

Source and compare at least three software toolkits/platforms/ languages used in your field of studies	4	Credits 4
Identify and contrast four (4) paradigms	4	
Create a programming environment (tailored to a specific tool or platform)	4	
Write code using a programming language for giving instructions for use of a software toolkit/platform	4	
Select and use correct data types (tailored to a specific tool or platform)	4	
Use complex types to organise data (tailored to a specific tool or platform)	4	
Add API's (Application Programming Interface) to an application (tailored to a specific tool or platform)	4	
Define a function (tailored to a specific tool or platform)	4	



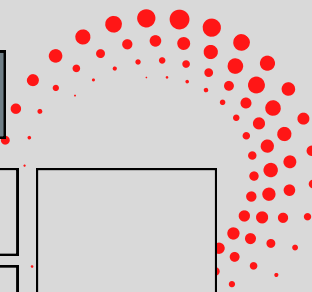
Practical Modules Breakdown

Use logical branch statements and comparison operators (tailored to a specific tool or platform)	4	Credits 3
Code loops (tailored to a specific tool or platform)	4	
Use and apply variable scopes (tailored to a specific tool or platform)	4	
Create queries to pull desired data using a structured query language (SQL) (applicable to data base) (tailored to a specific tool or platform)	4	
Handle errors and troubleshooting (tailored to a specific tool or platform)	4	
Identify the general steps for writing code (tailored to a specific tool or platform)	4	
Execute practical exercises 1, 2 and 3 using the specified product set	4	

Practical Module 03

Report data using spreadsheets	4	Credits 3
Summarise and format data using spreadsheet tables	4	
Create, use and edit pivot tables and pivot charts	4	
Create, use and edit dashboards	4	
Create and configure hierarchies and time data	4	
Apply a spreadsheet data model	4	
Import data from files	4	
Import data from databases	4	
Import data from reports	4	
Visualize data	4	
Scrape data from the web using an appropriate too	4	

Practical Module 04



Use spreadsheet data with BI technologies	5	Credits 4
Self-service BI technology solutions	5	
Shape and combine data	5	
Model data	5	
Use interactive data visualizations to represent data graphically	5	
Access data	5	
Use visualisation tools to present data as meaningful insights	5	

Practical Module 05

Write queries	5	Credits 4
Write SELECT queries	5	
Query multiple tables	5	
Sort and filter data	5	
Use SQL server data types	5	
Use data manipulation language (DML) to modify data	5	
Use built-in functions	5	
Group and aggregate data	5	
Use subqueries	5	
Use table expressions	5	

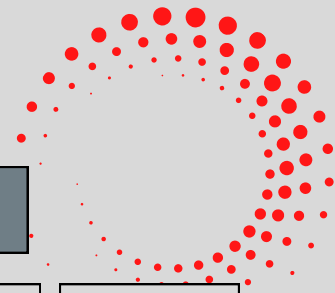
Use set operators	5	Credits 4
Use ranking, offset and aggregate functions	5	
Write queries using pivoting and grouping sets	5	
Execute stored procedures	5	
Program with SQL	5	
Implement error handling	5	
Implement transactions	5	

Practical Module 06

Apply the first steps of the data science life cycle	5	Credits 12
Work with programming languages and software packages, e.g. SAS, R, Python, etc.	5	

Practical Module 07

Apply the steps in the process for data analysis	5	Credits 12
Design and build a model	5	
Select and apply statistical principles, methods, techniques and tools to analyse data	5	
Apply statistical tools and techniques to collect, pre-process and analyse data	5	



Practical Module 08

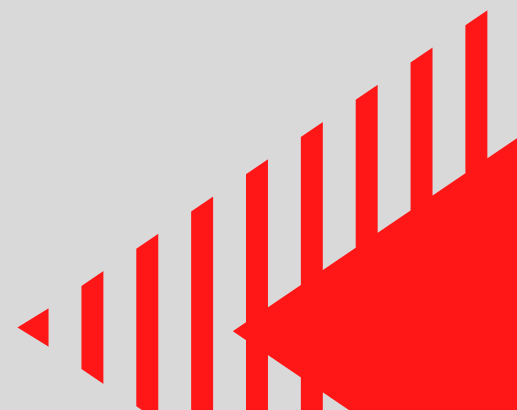
Explore data/visualise the data using a given platform	5	Credits 12
Model the data to extract meaningful information and insights	5	
Communicate results	5	

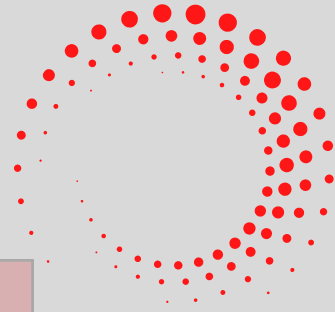
Practical Module 09

Collaborate with team members to apply innovative and problem-solving strategies	5	Credits 12
Apply design thinking process to solve a problem creatively and innovatively	5	

Practical Module 10

Present information to an audience	5	Credits 2
Conduct basic research (gather and explore data and information) on 4IR skills and application opportunities in the workplace	5	
Ensure compliance with the code of conduct and governance in the workplace	5	
Collaborate with team members in the workplace	5	
Attend and participate in meetings	5	





Workplace Modules

Attend induction program and familiarise self with company processes, procedures, tools and culture	5	Credits 16
Shadow and observe an experienced Data Analyst undertaking the following tasks	5	
Conduct the following tasks under supervision	5	

Workplace Modules

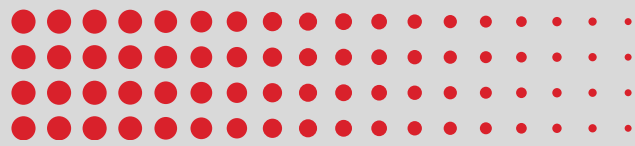
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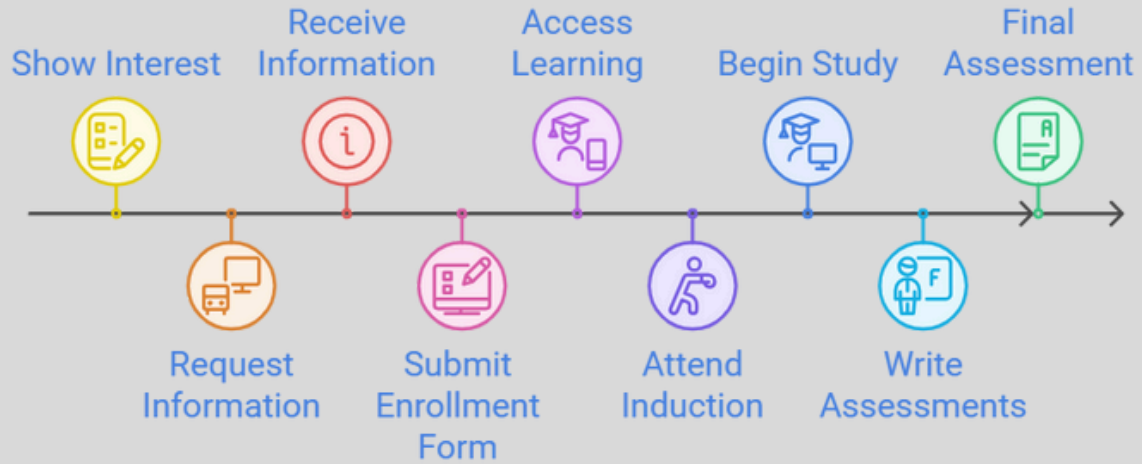
Workplace Modules

Mine and analyse datasets, draw valid inferences and present them successfully to management using a reporting tool. Execute the following activities and present a step-by-step report with examples and motivations	5	Credits 16
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Customer Journey

Enrollment and Completion Process for IQ Programmes



IQ Commitment

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- Flexible, Engaging Learning
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- Tailored Learning Paths & Career Development
- Recognition of Prior Learning
- Innovative Assessments & Real-World Learning
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