

SAQA ID
118708

DURATION
18 months

CREDITS
185

QCTO
MICT

Occupational Certificate:

**DATA SCIENCE
PRACTITIONER**
NQF Level 5



WHO SHOULD STUDY THIS COURSE?

The purpose of this qualification is to prepare a learner to operate as a Data Science Practitioner.

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 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.

A qualified learner will be able to:

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 analytic reports on patterns and trends using computer programming languages and explain those patterns and trends through e.g., visualization, storytelling, etc., using data visualization tools.

Rationale

The Presidential Commission on 4IR (PC4IR) report states that the key drivers of change in Human Capital and the Future of Work will be ubiquitous high-speed mobile internet, artificial intelligence, widespread adoption of big data analytics and cloud technology. Thus, with the emergence of the ‘4IR’ and the need to properly manage ‘Big Data’, a new generation of technologies and architectures, designed to economically extract value from very large volumes of a wide variety of data by enabling high velocity capture, discovery, or analysis, will emerge.

The 4th Industrial Revolution (4IR) is a fusion of advances in artificial intelligence (AI), robotics, process automation, the Internet of Things (IoT), genetic engineering, quantum computing, cyber security, cloud computing and data science.

There is an exponential demand for data analysts, data engineers, data architects and Data Science Practitioners, in response to the proliferation of complex and voluminous data generated by cloud-businesses and social media networks. To meet this demand, many organisations have started to consider developing skills internally by sharing resources, undertaking training programmes and partnering with others in the industry. This plays a crucial role in establishing a data-driven culture and currently available advanced technology to manipulate these big data and complex datasets.

The demand for qualified big data analysts is exceeding supply to the point where it can take many months to fill vacancies. The root problem of this is that big data analytics is a new field and the existing workforce skill sets must be adjusted to be able to work with large, sophisticated datasets. This shortage is acute and is growing exponentially. Recent research indicated that in 2020 the shortage of data scientists can best be summarised as follows:

- Year-on-year there is a growth of 37% in job listings for data scientists.
- Data scientist ranked 3rd amongst top jobs for 2020.
- The average annual salary increase of data scientists is 14%.

Data science is an inter-disciplinary field that uses scientific methods, processes, algorithms, and systems to extract knowledge and insights from many structured and unstructured data. Data science is related to data mining, machine learning and big

data. The data science practitioner's duties can include developing strategies for analysing data, preparing data for analysis, exploring, analysing, and visualizing data, building models with data using programming languages and deploying models into applications. This qualification covers the collection and transformation of data, solving business-related problems through the analysis of data to uncover patterns and trends and the preparation and presentation of descriptive analytic reports using programming techniques, mathematics, and statistics.

The above information confirms the growing need for the Occupational Certificate: Data Science Practitioner. There is a plethora of similar qualifications registered on the NQF. None of these qualifications are at NQF 5 and they are not occupational qualifications.

Data science will bring many benefits to society, touching a wide range of aspects in the daily life of the individual. Scientists can now develop algorithms that can help predict infections based on data analysis, hours before physical symptoms appear. Big data is key to the success of healthcare organizations. They can deliver immunizations, healthcare, and water to some of the world's poorest populations by analyzing big data. Companies use the data they collect from the individual to determine what kind of product - whether music, movies, or consumables - to produce.

The target group for this qualification is school leavers, graduates from TVET colleges, new entrants into the sector and existing employees who have experience in this field, but without formal recognition of skills and competencies. No professional registration or licensing is expected for Data Science Practitioner to seek employment

in the sector. Data Science Practitioners can find employment as Data Analyst Assistants, Junior Data Analysts, Data Miners, Data Modelers, Data Custodians or Management Information Analysts.

Exit Level Outcomes

- 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., visualization and storytelling etc., using data visualization tools.

ASSOCIATED ASSESSMENT CRITERIA

Exit Level Outcome 1:

Frame the problem to exactly define what is needed or expected and well-defined goals are set.

Undertake data collection from multiple sources, including primary, secondary, internal, and external sources to generate relevant data for analysis.

Retrieve and extract data from multiple sources into a scratch table using suitable platforms to make data visible before analysis.

Clean, wrangle, scrub and reorganize data in a format that can easily be read by either human or machine.

Exit Level Outcome 2:

Design and use a query to retrieve data which fit the criteria from a database.

Apply a combination of analytical skills, problem-solving skills, logical reasoning, and communication



skills to define tendencies in data sets.

Apply statistical principles, methods, techniques, and platforms to analyze and interpret data sets (sets of groupings of datasets or data sources), paying particular attention to trends and patterns that could be valuable for diagnostic and predictive analytics efforts.

Exit Level Outcome 3:

Confirm visual elements to ensure they accurately represent the results of the data analysis.

Create visualizations, including dashboards, flowcharts, and graphs to communicate business concepts through visuals.

Check information to ensure it answers the questions or explains solutions to the problems defined at the start of the data analysis life cycle.

Use the results of the data analysis to perform predictive analysis.

Discover meaning in data, create insights and storytelling or use other techniques to present data.

Identify new process improvement opportunities.

Integrated Assessment: 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 together with work experience leads to entrance in the integrated external summative assessment.

Integrated summative assessment.

An external integrated summative assessment, conducted through the relevant QCTO Assessment Quality Partner is required for the issuing of this qualification. The external integrated summative assessment will focus on the exit level outcomes and associated assessment criteria.

The external integrated summative assessment will be conducted through a theoretical assessment and the

evaluation of practical tasks at decentralized approved assessment sites in a simulated environment and conducted by an assessor(s) registered with the relevant AQP.

ARTICULATION OPTIONS

National Certificate: Business Analysis Support Practice, NQF Level 5.

National Certificate: Business Analysis, NQF Level 6.

Qualifying for External Assessment:

To qualify for an external assessment, learners must provide proof of completion of all required knowledge and practical modules by means of statements of results and a record of completed work experience.

Unit Standard			
KNOWLEDGE MODULES	Introduction to Data Science and Data Analysis	4	6
	Logical Thinking and Basic Calculations	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 Visualization	5	16
	Introduction to Governance, Legislation and Ethics	4	3
	Fundamentals of Design Thinking and Innovation	4	4
	4IR and Future Skills	4	1
			66

Unit Standard			
PRACTICAL SKILLS MODULES	Apply Logical Thinking and Math's Refresher	4	3
	Apply Code to Use a Software Toolkit/Platform in the Field of Study or Employment	4	4
	Use Spreadsheets to Analyze and Visualize Data	4	3
	Use a Visual Analytics Platform to Analyze and Visualize 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



WORK EXPERIENCE

Unit Standard		
Data Collection and Pre-processing Processes	5	16
Statistical Data Analysis Processes	5	16
Data visualization and Reporting Processes	5	16
Capstone Project Using an Appropriate Toolkit	5	12
		60

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