

Vocational Qualifications Pathway (VQP) for Data Science

Job Area Job Level	Data Science
Master Level	<i>The ICT practitioners at this level mainly responsible for decision-making processes. They oversee the entire IT operations and strategic development direction in the organization. Professionals at this level require broad corporate perspective, good communication skills and great technology knowledge.</i>
Job Title	Director of Data Analytics
	Director of Data Science
	Chief Data Scientist
Specialist Level	<i>The ICT practitioners at this level mainly involve in managerial processes. They may associate with individual technical departments and manage those departments by applying their technical and managerial skills. The major tasks performed by the professionals at this level is to manage the individual activities and project segments to lead the project towards completion within the assigned budget and stipulated deadline.</i>
Job Title	Data Architect
	Data Engineer
	Data Scientist
	Data Analyst
Practitioner Level	<i>The ICT practitioners at this level manage certain parts of technical processes depending on their subject matter expertise. Many different profiles are served by professionals at this level who maybe fresh sub-degree graduates or those who possess certain experience in their field.</i>
Job Title	Junior Data Engineer
	Junior Data Analyst
	Junior Data Scientist
Support Level	<i>The ICT practitioners at this level provide basic technical support depending on their subject matter expertise. Many different profiles are served by the practitioners at this level who maybe S6 graduates with relevant ICT skills and knowledge or those who possess little experience in their field.</i>
Job Title	Computer Operator
	User Support Staff
	Technical Support Services Staff
	Help Desk Operator
	Field technician

Proposed Competency Requirements (Data Science - Master Level)

Relevant Job Titles:

- Director of Data Analytics / Director of Data Science / Head of Data Scientist

Area of Work / Cluster Name	Major Task	Competency Requirements	Units of Competency (UoCs) Number	Relevant Qualification for fulfilling Competency Requirements
Strategies and policies for Data Science	1. Lead innovation within the organization and define how additional business value could be created through the utilization of the organization’s data assets and analytics	<ul style="list-style-type: none"> ▪ Formulate business strategies and policies ▪ Review, design and re-engineer business processes to form a new business architecture ▪ Establish a business case for an IT investment ▪ Identify and evaluate the data sources to fulfil the data requirements in support of business objectives 	<p>111201L6</p> <p>111125L6</p> <p>ITSWG5617A</p> <p>111136L6</p>	Obtain qualification via training programmes (QF Level 6)
	2. Develop, plan and manage the overall policies and goals of the data science function of the organization	<ul style="list-style-type: none"> ▪ Define data governance policies and architecture principles ▪ Develop application integration architecture ▪ Define data classification policy for enterprise ▪ Define and establish the data architectures 	<p>111123L6</p> <p>111124L6</p> <p>111133L6</p> <p>111138L6</p>	

Area of Work / Cluster Name	Major Task	Competency Requirements	Units of Competency (UoCs) Number	Relevant Qualification for fulfilling Competency Requirements
Strategies and policies for Data Science (continued)	3. Ensure all key data management procedures and processes compile with the relevant regulatory requirements.	<ul style="list-style-type: none"> ▪ Review and comply with organisational policies and procedures, relevant laws and regulatory requirements ▪ Review the ethical and social issues for IT applications ▪ Develop compliance framework for the meeting of ethical and regulatory requirements related to enterprise data 	<p style="text-align: center;">111205L6</p> <p style="text-align: center;">111208L6</p> <p style="text-align: center;">111132L6</p>	
Application development for Data Science	4. Evaluate and select the appropriate tools, techniques, staffing and methodologies to extract and manage data for application development.	<ul style="list-style-type: none"> ▪ Review the emerging technologies and cross-functional strategies ▪ Understand the use of data concepts and topologies ▪ Appraise and select the appropriate data management tools and services to manage the target data based on different requirements ▪ Appraise, select and integrate the appropriate data analytics and/or modelling solutions to perform the data analytics process based on different requirements ▪ Keep awareness towards autonomous 	<p style="text-align: center;">111207L6</p> <p style="text-align: center;">111135L6</p> <p style="text-align: center;">111141L6</p> <p style="text-align: center;">111144L6</p> <p style="text-align: center;">111153L6</p>	(Continued) Obtain qualification via training programmes (QF Level 6)

		<p>decision making process on the impact of business</p> <ul style="list-style-type: none">▪ Plan and develop the customised visualisation tools based on the business requirements	111150L6	
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Proposed Competency Requirements (Data Science - Specialist Level)

Relevant Job Titles:

- Data Architect / Data Engineer / Data Scientist / Data Analyst

Area of Work / Cluster Name	Major Task	Competency Requirements	Units of Competency (UoCs) Number	Relevant Qualification for fulfilling Competency Requirements
Development of data collection, analysis and management tools	1. Develop and implement data analyses, data collection systems and other strategies that optimize statistical efficiency and quality	<ul style="list-style-type: none"> ▪ Plan and develop the analytics and modeling tools ▪ Design and develop data management tools and services to manage the target data based on different requirements ▪ Perform the data management processes using the identified tools ▪ Perform model training, testing and validation in evaluating and optimising the model based on various metrics 	<p>111147L6</p> <p>111142L6</p> <p>111143L6</p> <p>111146L6</p>	Obtain qualification via training programmes (QF Level 6 & 5)
Data Acquisition and database management	2. Acquire data from primary or secondary data sources and maintain databases/data systems	<ul style="list-style-type: none"> ▪ Manage and implement different data acquisition options for the identified internal or external sources ▪ Conduct and review pre-processing and transformation of the data with data quality management 	<p>111137L6</p> <p>111140L6</p>	

Area of Work / Cluster Name	Major Task	Competency Requirements	Units of Competency (UoCs) Number	Relevant Qualification for fulfilling Competency Requirements
Data Acquisition and database management (continued)	3. Examine and identify database structural necessities by evaluating client operations, applications, and programming	<ul style="list-style-type: none"> ▪ Check usability of a target data architecture 	111139L6	(Continued) Obtain qualification via training programmes (QF Level 6 & 5)
		<ul style="list-style-type: none"> ▪ Build the analytics solutions/models to support better business decisions and improve performance 	111145L6	
		<ul style="list-style-type: none"> ▪ Perform and evaluate the autonomous decision making process 	111154L6	
	4. Assess database implementation procedures to ensure they comply with internal and external regulations	<ul style="list-style-type: none"> ▪ Enforce enterprise data standards for business needs 	111134L6	
		<ul style="list-style-type: none"> ▪ Appraise the various data visualisation tools and select the appropriate tools according to user requirements 	111149L6	
	5. Prepare accurate database design and architecture reports for management and executive teams	<ul style="list-style-type: none"> ▪ Develop clear and actionable recommendations based on the analysis results to the stakeholders for decision support 	111152L6	

Proposed Competency Requirements (Data Science - Practitioner Level)

Relevant Job Titles:

- Junior Data Engineer / Junior Data Analyst / Junior Data Scientist

Area of Work / Cluster Name	Major Task	Competency Requirements	Units of Competency (UoCs) Number	Relevant Qualification for fulfilling Competency Requirements
Development and Maintenance of database system	1. Support the database system development with all aspects of software design and coding	<ul style="list-style-type: none"> ▪ Understand and utilize the preset data visualisation dashboard/displays tools ▪ Perform script programming 	111151L4 107936L4	Obtain qualification via training programmes (QF Level 3 & 4)
	2. Monitor the technical performance of database systems	<ul style="list-style-type: none"> ▪ Verify and validate that the deployed / migrated software and the existing software are functioning properly 	111159L4	
	3. Conduct data discovery activities, perform cause analysis, and make recommendations for the remediation of data quality issues	<ul style="list-style-type: none"> ▪ Perform system testing against user, technical and hosting requirements 	111160L4	

Proposed Competency Requirements (Data Science - Support Level)

Relevant Job Titles:

- Computer operator / User support staff / Technical support services staff (TSS) / Help desk operator /Field technician

Area of Work / Cluster Name	Major Task	Competency Requirements	Units of Competency (UoCs) Number	Relevant Qualification for fulfilling Competency Requirements
Network Support	1. Network Support	<ul style="list-style-type: none"> Install and configure client/server application Configure WAN connection Troubleshoot network issues 	<p>107882L3</p> <p>107883L3</p> <p>107884L3</p>	<p>Obtain qualifications via training programmes (QF Level 3)</p> <p>Or</p> <p>RPL Mechanism (QF Level 3 RPL Cluster: TOS010L3)</p>
Network Security Support (Technical Support)	2. Network Security Support	<ul style="list-style-type: none"> Administer basic network security Administer basic website security Administer perimeter firewall Strengthen workstation protection 	<p>107887L3</p> <p>107889L3</p> <p>107890L3</p> <p>107891L3</p>	<p>Obtain qualifications via training programmes (QF Level 3)</p> <p>Or</p> <p>RPL Mechanism (QF Level 3 RPL Cluster: ITOS011L3)</p>
User Support	3. User Support	<ul style="list-style-type: none"> Provide support to mobile device users Troubleshoot client device hardware issues Perform remote support 	<p>107904L3</p> <p>107905L3</p> <p>107907L3</p>	<p>Obtain qualifications via training programmes (QF Level 3)</p> <p>Or</p> <p>RPL Mechanism (QF Level 3 RPL Cluster: ITOS012L3)</p>
System Security Support	4. System Security Support	<ul style="list-style-type: none"> Create and maintain user accounts on server Configure user access control on server Administer system security 	<p>107885L2</p> <p>107886L3</p> <p>107888L3</p>	<p>Obtain qualifications via training programmes (QF Level 3)</p> <p>Or</p> <p>RPL Mechanism (QF Level 3 RPL Cluster: ITOS009L3)</p>

Area of Work / Cluster Name	Major Task	Competency Requirements	Units of Competency (UoCs) Number	Relevant Qualification for fulfilling Competency Requirements
Web Support	5. Web Support	<ul style="list-style-type: none"> ▪ Troubleshoot web browser and connection issues ▪ Maintain website performance ▪ Build simple web site using content management systems ▪ Maintain website 	<p style="text-align: center;">107909L3</p> <p style="text-align: center;">107910L3</p> <p style="text-align: center;">107911L3</p> <p style="text-align: center;">107912L3</p>	<p style="text-align: center;">Obtain qualifications via training programmes (QF Level 3) Or RPL Mechanism (QF Level 3 RPL Cluster: ITOS013L3)</p>
Network and Security Support	6. Network and Security Support	<ul style="list-style-type: none"> ▪ Build a small wireless LAN ▪ Install and configure network components/devices ▪ Install and configure client/server application ▪ Strengthen workstation protection ▪ Troubleshoot web browser and connection issues 	<p style="text-align: center;">107879L2</p> <p style="text-align: center;">107880L2</p> <p style="text-align: center;">107882L3</p> <p style="text-align: center;">107891L3</p> <p style="text-align: center;">107909L3</p>	<p style="text-align: center;">Obtain qualifications via training programmes (QF Level 3) Or RPL Mechanism (QF Level 3 RPL Cluster: ITOS016L3)</p>