


SKILLS PROGRAMME DOCUMENT						
Skills Programme Title		Spatial Intelligence Data Scientist				
NQF Level	5	Credits	56	Duration in days	6 Months	
Skills Programme ID Number		SP-210604				
Skills Programme Status	Approved	Start Date		End Date		
		21/06/2021		21/06/2026		
Last date for enrolment		21/06/2027	Last date for achievement		21/06/2030	

SKILLS PROGRAMME DETAILS

Title	Spatial Intelligence Data Scientist
Sub Title	Location Analytics Scientist
NQF Level	5
Duration	6 Months
Credits	56
Quality Assuring Body	Quality Council for Trades and Occupations (QCTO)
Skills Rationale	<p>Since the beginning of the technological revolution, many countries have been left behind because they were unable to adapt to changing technological trends. Others were more successful in adapting to changing technological trends, but the most successful countries are those that have embraced Disruptive Thinking through innovation and Digital Transformation. Countries that embrace without ignoring their priorities are successful. The NDP is a plan for the country, with the following priorities:</p> <p>i) increasing employment through faster economic growth; ii) improving the quality of education, skills development, and innovation; and iii) strengthening the state's ability to play a developmental, transformative role.</p> <p>Data has never been more important in the modern economy. Businesses, governments, and families must navigate the complexities of a world enabled by new technologies and creative business practices. In many cases, making sound decisions is impossible without reliable information about the economic and social environments. Most municipalities and government institutions are currently confronted with the challenge of obtaining</p>

	<p>comprehensive, consistent, and credible data. This problem can be solved permanently if our proposal is implemented.</p> <p>As a result, developing individuals with both technical knowledge of data manipulation and scientific knowledge of geospatial analytics is critical. This skills program is intended to provide learners in the geospatial sector with data science skills and tools that will allow them to solve problems relevant to the digital economy or age. This skills program is designed to geo-enable the Fourth Industrial Revolution. By using methodical and procedural analytics to understand causes, inform policy, and address critical policy-relevant questions in human geography, economic geography, planning, the environment, and development</p> <p>After completing this program, the Geospatial Intelligence Data Scientist will be able to acquire, digitize, aggregate, manage, process, and visualize data in narrative form, allowing them to effectively leverage data to solve business problems. Qualifications leading to this qualification typically have a strong professional or career focus, and holders of this qualification are typically prepared to enter a specific labour market niche.</p>
<p>Related registered qualification/s</p>	<p>The following qualifications are related to the skills programme and registered with the SouthAfrica Qualifications Authority and Quality Council for Trades & Occupations</p> <ul style="list-style-type: none"> • 72206 National Certificate: Computer Science NQF Level 5 Min Credit: 120 • 101407 Occupational Certificate: Geomatics Officer NQF Level 5 Min Credits: 174 • 101442 Diploma in Geoinformation Science and Technology NQF Level 6 Min Credits: 252 • 100772 Diploma in Geomatics NQF Level 6 Min Credits: 360 • 117722 Bachelor of Data Science NQF Level 8 Min Credit: 480

	<ul style="list-style-type: none"> • The list below shows the international qualifications which are related to this skills programme • Yonsei University- Spatial Data Science and Applications (short course) • University of California, Irvine - Data Science Fundamentals Specialization (short course) • Liverpool University -Geographic Data Science (BSc Qualification) <p>The list below shows the international qualifications which are related to this skills programme</p> <ul style="list-style-type: none"> • Yonsei University- Spatial Data Science and Applications (short course) • University of California, Irvine - Data Science Fundamentals Specialization (short course) <p>Liverpool University -Geographic Data Science (BSc Qualification)</p> <p>The MICT SETA has embarked on a process of developing and registering qualifications which will respond to the Fourth Industrial Revolution demand. The SETA has submitted the qualifications to the Quality Council for Trades and Occupations (QCTO) for approval, here are some of the qualifications that were submitted:</p> <ul style="list-style-type: none"> • Artificial Intelligence • Cyber security • Cloud computing • Data science • Software development • Internet of things • Robotic Processing Automation • Design thinking • Quality engineering Automation • eWaste
Purpose	<p>To improve service delivery, government authority such as districts will undoubtedly require new or improved methods of operation. The first and most important step in any digital development, including the</p>

creation of modern digital skills content, is to develop digital skills. Work automation and the prospect of losing jobs is a significant concern in this digital age. Forecasts indicate a decline in traditional work and an urgent need for new roles. The private sector has high ambitions for digital adoption of their businesses, whereas the government lacks behind due to limited resources, regulation, and skills to support and accelerate this digital adoption thus, there must be a deliberate change focus, as well as workforce upskilling on digital telecommunications.

The South African government has made a firm policy commitment to this effect by establishing a Presidential Commission on 4IR to capitalize on the country's digital transformation agenda and understand the conditions required to assist citizens. Geo-enabled fourth industrial revolution (4IR) is an important part of this disruptive journey. The advanced skills program in Spatial Intelligence Data Science is required to meet the objectives outlined in policies such as the National Development Plan and the District Development Model.

The advanced skills program in Spatial Intelligence Data Science is designed to equip learners with the analytical and technical skills needed to create new geospatial solutions that go beyond traditional GIS applications. This program explores the field of data science while focusing on geospatial intelligence and analytics. Individuals with a background with entry level knowledge in GIS, mathematicians, computer science and statisticians who would like to expand their skills in data analysis with the goal of solving real-world problems using spatial analytical methods will benefit from this skill program. It is also a learning part way for student who have completed Spatial Intelligence Data Science NQF Level 5 skills program. Students will learn how to design, develop, and evaluate spatial data science methods and technologies in the fields of app development, geospatial intelligence programming, big data analytics, and augmented and virtual reality for spatial intelligence in a variety of decision-making contexts. These abilities are critical not

	only for improving South Africa's digital technology, but also for creating a state that is digitally transformed in its programs to improve citizens' livelihoods and, as a result, drive economic growth.	
Content		
Minimum entry requirements	The minimum entry requirement for this skills programme is: <ol style="list-style-type: none"> 1. National Senior Certificate, NQF Level 4 2. National Certificate (Vocational), NQF Level 4 National N Diploma, NQF Level 5.	
Exit Level Outcomes	Upon qualifying learners who complete this skills programme will be able to: <ol style="list-style-type: none"> 1. Understand number systems and complex number concepts, recall the meaning of terms such as real part, and relate complex numbers 2. Use statistical and mathematical analytic skills to solve big data problems in a geospatial context. 3. Demonstrate knowledge and comprehension of the role of information technologies in the digital economy. 4. Methodically access and solve problems related to digital transformation in general for the fourth industrial revolution. 5. Acquire, process, perform, and analyze data management issues as they relate to business problems. Conduct investigations of broadly defined problems; locate, search, and select relevant unstructured data from codes, databases, and literature; analyze and interpret results to provide valid conclusions. 6. Demonstrate knowledge and understanding of the impact of spatial intelligence activities on society, the economy, the industrial and physical environment, and address issues 7. Demonstrate knowledge and skills for effectively implementing cloud computing for enterprise solutions 	
Assessment	Continuous Assessment	

	<p>For formative assessment, methods such assignments, class tests, quizzes, and classwork will be used. E-Assessment will be used to conduct these assessments, which is a type of assessment that includes an electronic component that includes one or more of the following: E-testing, e-portfolios, and e- marking from and LMS. These assessments are intended to be diagnostic evaluation methods that aid in identifying aspects of students' learning as they progress to deepen and shape subsequent learning</p> <p>Supervised Assessment</p> <p>A variety of assessment methods, tools, and techniques will be used in integrated assessment to allow the learner to demonstrate applied competence.</p> <p>Assessments of work-based projects and building apparatus programs will be carried out for the exit level modules. This includes supervised summative assessment examinations, all of which aim to summarize previous learning in order to register, mark, or certify the learner's achievement</p>
<p>Recognition of Prior Learning (RPL)</p>	<ul style="list-style-type: none"> • Learners will gain access to the skills programme through RPL for Access as provided for in the QCTO RPL Policy. RPL for access is conducted by an accredited institution, skills development provider or workplace accredited to offer that specific skills programme. • Learners who have already acquired competencies of modules of a skills programme will be exempted from modules through RPL. Such learners will be awarded credits towards the skills programme. • Learners who complete this skills programme will accumulate credits towards the relevant full or part qualification. The Credit Accumulation and Transfer (CAT) Policy shall apply to these learners
	<p>Careers in data science cut across different industries and sector</p>

<p>Work Opportunities and further learning</p>	<ul style="list-style-type: none"> •Department of Monitoring and Evaluation: Digitize all projects in the country and provide a portfolio of evidence near real-time •Statistics South Africa: National Census and any other data collection tasks to have a near-real-time dataset •Local Municipalities: Utilities, Assets, Spatial Plans, Infrastructure, Demographics, SDBIP, IDP, DDM, etc. •Provincial Departments: Roads, Human Settlement Projects, Public Works Assets, <p>APP's etc</p> <ul style="list-style-type: none"> •National Projects e.g. SIPS, MTSF, APP's, Human Settlements, SA Connect, Education, <p>Health etc</p> <ul style="list-style-type: none"> •Eskom field inspections, field surveys, asset verification and stockpile surveys. •Independent Development Trust (IDT) field data collection and project status monitoring •All 21 SETA's: Shared services, skills centres, location of learners, budgets and expenditure, project information, demographics etc. <p>Agriculture: Agricultural assets, field crops, disasters, animal disease, farm-holder database, farmer register, animal branding, stakeholders, germplasm, genetics datasets, etc.</p> <p>Further learning</p> <p>Upon successful completion of 56 credits, learners can articulate to a;</p> <p>Horizontal:</p> <p>Higher Certificate in Mathematics and Statistics NQF Level 5 Higher Certificate in Physical Sciences NQF Level 5 Vertical: Diploma in Geo-information Science and Technology at NQF Level 6 Diploma in Information Technology NQF Level 6</p>
<p>Skills Development Provider Accreditation Requirements</p>	<p>a) Human resource requirements</p>

	<ul style="list-style-type: none">• Facilitator/learner ratio 1:10 <p>b) Physical resource requirements</p> <ul style="list-style-type: none">• Training Lab with Computers and furniture (chairs and tables)• Training Manuals, Learner Guides• Writing equipment (pencils/paper)• Examples of equipment needed (relevant data, software and GPS devices) <p>c) Legal requirements</p> <ul style="list-style-type: none">• Accreditation with QCTO <p>d) Safety requirements</p>
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