NATIONAL COUNCIL FOR TECHNICAL EDUCATION

NOVEMBER 2022

PROPOSED OCCUPATIONAL STANDARDS

FOR IT TECHNOLOGIST

OCCUPATION: INFORMATION TECHNOLOGY

LEVEL: NTA 7

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TABLE 1: DACUM CHARTS FOR IT TECHNOLOGIST – NTA 7. **Error! Bookmark not defined.**

FOREWORD

The National Council for Technical Education (NACTE) is a corporate body established by the National Council for Technical Education Act, Cap.129. The Act provides a legal framework for the Council to coordinate the provision of technical education and training in Tanzania. The mandate of NACTE is three-fold, namely; Regulatory, Quality Assurance and Policy Advisory.

In discharging its mandate, the Council has been charged with the responsibilities, among others, to:

(a) assist technical institutions in the transmission of knowledge, principles and training in the field of technical education and training for the benefit of the people of Tanzania;
(b) assist technical institutions in the overall development of the quality of education they provide and to promote and to maintain approved academic standards;
(c) establish and make awards in technical education which are consistent in standard and comparable to related awards in Tanzania and internationally; and
(d) ensure that the quality of education required for the awards is met and maintained throughout the duration of the delivery of the course.

In the course of execution of these responsibilities, the Council has been instituting various measures aiming at advancing the quality of training provided in technical institutions in respect of the changing demands of the labour market, both local and international.

To achieve the above obligation, NACTE, under the Ministry of Education, Science and Technology implemented the East Africa Skills for Transformation and Regional Integration Project (EASTRIP), a project aiming at promoting regional integration through supporting the regional corridors and sector markets, developing common standards and qualifications, and promoting mobility of students, faculty, and graduates. The project supports the Government of Tanzania to address shortage of skills in five sectors namely:

(a) Energy;
(b) Construction;
(c) Information and Communication Technology (ICT);
(d) Transportation; and
(e) Agri-business.

To address the skills, miss-match and shortage in the five (5) sectors in the country, the project funded, among others, a component of Development of Occupational Standards for Technical and Vocational Education and Training (TVET). In this regard, NACTE endeavoured to identify qualified and highly experienced experts in the five sectors from both the industry and training institutions to carry out the development of Occupational Standards for occupations within the five sectors. The exercise was carried out at Morogoro Teachers College, Morogoro, from 27th August to 23rd September, 2021. The output of the exercise is Occupational Standards for 14 occupations. Occupational standards for IT Technologist are among the 14 occupational standards which have been developed.

Since Occupational Standards are statements of work performance reflecting the ability to successfully complete the functions required in an occupation, as well as the application of knowledge, skills, attitudes and understanding in an occupation, it is the Council's expectations that the developed standards will form a robust base for decision making and provide explicit guidance to policy makers, curriculum developers, educators, employers and other stakeholders in matters related to manpower planning as well as execution of Technical and Vocational Education and Training undertakings.

Prof. J. W. Kondoro
Chairman

Dar es Salaam
November 2022

ACKNOWLEDGEMENT

The National Council for Technical Education (NACTE) is charged with the mandate to be the Quality Assurance organ of the Government in matters related to Technical and Vocational Education and Training (TVET) and production of qualified manpower for both local and international labour markets. In order to realize this obligation, NACTE endeavours to institute policies, guidelines and standards and to set the quality benchmarks for training institutions.

However, this is only possible if there is a strong base, linking the training institutions on one hand and the demands of the industry/labour market for relevant manpower on the other hand. Therefore, the Council undertook a step to develop Occupational Standards in sectors considered to be the engine to steer the country's desire to achieve an industrial economy. This exercise would not be a success without the input and support from our stakeholders. I am indebted to acknowledge some of them here.

I wish to acknowledge and appreciate the support from the Ministry of Education, Science and Technology through the East Africa Skills for Transformation and Regional Integration Project (EASTRIP) for the financial support which facilitated the preparation of this document. I also wish to appreciate Mrs Leah Lukindo and Eng. Dr. Simon Baregu for the tireless efforts and commitment in facilitating and guiding the standards development process, Ms. Eileen Tzamburakis and Ms. ChausikuYakweli Ibrahim for compiling and type setting the final document; and the NACTE Secretariat for coordinating the whole exercise.

In a very special way I wish further to extend my sincere gratitude to this team of wonderful experts who tirelessly dedicated their time and availed their invaluable intellect in the preparation of this document. I would like to recognise the colossal inputs of the following experts:

S/N	Name	Designation	Organization
1	Dr. Dennis Lupiana	Lecturer	Institute of Finance Management (IFM)
2	Eng. Dr. Moses Makoko	Head of ICT	University of Dar-es-Salaam – College of Information Communication Technology

S/N	Name	Designation	Organization
3	Dr. Nkundwe Mwasaga	Lecturer	Dar-es-Salam Institute of Technology

In addition, NACTE wishes to further enhance the internationalization of occupational standards and promote the modernization and internationalization of industries, thereby facilitating Tanzania's integration into the international market and expanding its development potential. Therefore, NACTE has invited China-Africa Vocational Education Alliance and China-Africa (Chongqing) Vocational Education Alliance to participate in the development, revision and review of occupational standards documents in collaboration with Chinese vocational institutions, so as to make use of their rich experience in vocational education efforts and rely on China's advanced and complete industrial chain and position in the international market to contribute to the development of vocational education and related industries in Tanzania.

Therefore, I would like to express my sincere gratitude to this specialized team of many Chinese institutions and experts. I thank them for their hard work and dedication, and for contributing their wisdom and experience to the preparation of this document. I would like to thank the following institutions and experts for their support:

S/N	**Institute**	**Name**	**Title/Area of Expertise**
1	Chongqing College of Electronic Engineering	Tao Yaxiong	Professor/ICT
2		Li Zhangyong	Lecturer/Information and Communication Engineering
3		Liu Danni	Teaching Assistant/Information and Communication Engineering
4		Zhu Youmei	Senior Engineer/Communication and Information Systems
5		Ran Fengli	Lecturer/Information and Communication Engineering
6		Zhang Bowei	Senior Engineer/Communication and Information Systems
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		Chuanzhong	Engineering
1	Chongqing City Vocational College	Liu Zhendong	Professor/Networking Technology
2		Liang Xiurong	Professor/IoT Technology
3		Qian You	Associate Professor/Data Processing Technology
4		Liao Li	Associate Professor/Data Processing Technology
5		Fan Lingyun	Associate Professor/Software Technology
6		Huang Tianchun	Senior Engineer/Data Processing Technology
7		Zhang Xiaohua	Senior Engineer/Software Technology
8		Liu Li	Professor/Sensing Big Data Analytics Technology
9		Wang Lidan	Professor/Artificial Intelligence Technology
10		Chen Guoping	Professor/MMW Near-field Imaging, RF Microwave Technology
1	Shandong Vocational College of Industry	Gong Jianxue	Associate Professor/Information and Communication Engineering
2		Dong Jiajia	Associate Professor/Communication and Information Technology
3		Qu Wenpeng	Teaching Assistant/Information and Communication Engineering
4		Xu Liqiang	Teaching Assistant/Big Data Technology
5		Yan Xiaopeng	Lecturer/Computer Application Technology
6		Geng Xue	Teaching Assistant/Information and Communication Engineering
7		Wang Zhenhuan	Teaching Assistant/Multimedia Information Technology

Dr. A. B. Rutayuga — Dar es Salaam

Executive Secretary — **November, 2022**

ABBREVIATIONS

ICT	Information and Communication Technology
NACTE	National Council for Technical Education
NOS	National Occupational Standards
OS	Occupational Standards
TET	Technical Education and Training
TVET	Technical and Vocational Education and Training

GLOSSARY OF TERMS

Circumstantial Knowledge:	Detailed knowledge, which allows the decision-making in regard to different circumstances and cross cutting issues
Competence:	The ability to use knowledge, understanding, practical and thinking skills to perform effectively to the workplace standards required in employment.
Competency:	A description of the ability one possesses when able to perform a given occupational task effectively and efficiently.
Competency-Based Education:	An instructional program that derives its content from validated tasks and bases assessment on the learner's performance
Curriculum:	A description or composite of statements about "what is to be learned" by the trainee/student in a particular instructional programme; a product that states the "intended learning outcomes".
Educational/Training Programme:	The complete curriculum and instruction (what and how) that is designed to prepare a person for employment in a job or other particular performance situation.
Occupation:	A specific position requiring the performance of specific tasks – essentially the same tasks are performed by all employees having the same title. (Example: baker)
Occupational Analysis:	A process used to identify the tasks that are important to employees in any given occupation
Occupational Area	This is a broad grouping of related jobs. Example: food service
Occupational Competence	The application of knowledge and skills to perform consistently to the standards required in the work context.
Occupational Standards:	Specific requirements of competences people are expected to demonstrate in a particular occupational area, including knowledge and relevant attitudes. They also act as performance tool of assessment of the pre – scribed

outcomes.

Performance Criteria: indicate the expected end results or outcome in form of evaluative statements.

Skills: The ability to perform occupational tasks with a high degree of proficiency within a given occupation. Skill is conceived of as a composite of three completely interdependent components: cognitive, affective, and psychomotor.

Standards: It is a set of statement, which if proved true under working conditions, means that an individual is meeting an expected level and type of performance

Task Analysis: The process of analysing each task to determine the steps, related knowledge, attitudes, performance standards, tools and materials needed, and safety concerns required of employees performing it.

Tasks: A work activity that has a definite beginning and ending, is observable or measurable, consists of two or more definite steps, and leads to a product, service, or decision.

Underpinning Knowledge: This is crucial knowledge that an individual must acquire in order to demonstrate competences that are associated in performing a given task.

Verification Process: The process of having experts review and conform the importance of the task (competency) statements identified through occupational analysis. Other questions, such as the degree of task learning difficulty are also frequently asked. This process is also sometimes referred to as validation.

1.0 INTRODUCTION

Technical Education and Training (TET) is one of the most important education sub-sectors in Tanzania, responsible for developing a skilled workforce to support the country's industrialization economic agenda. Tanzania's Development Vision 2025 intends to raise the country's economy to a middle-income status. This requires a skilled workforce that is aligned with the needs of the public and private sectors of the economy. The National Council for Technical Education has begun the job of drafting Occupational Standards that will eventually be adopted as National Occupational Standards for TET in order to ensure that it meets the needs of the labour market and the country's economic agenda.

National Occupational Standards (NOS) are performance criteria that are matched with labour market demands. Each National Occupation Standard describes functions, performance standards, and knowledge/understanding for one important function or task. They combine skills, knowledge, and attitudes to describe best practice. They are useful tools for establishing job roles, personnel recruiting, supervision, and appraisal, as well as TET standards. They're also helpful for benchmarking and harmonizing qualifications on a national and international level. Standards, in general, provide a solid framework for high-quality TET that is labour market-relevant, current and consistent in delivery across all public and private institutions.

However, it must be noted that, Occupational Standards and Training standards/qualifications standards are different. Occupational standards are defined in terms of activities performed by a person in a selected occupation (e.g., an electrical engineer designs electrical wiring circuits, performs trouble shooting in electrical wiring, etc.) and they are usually defined by employers following procedures agreed upon by all stakeholders. Education and training standards are developed from the activities defined in occupational standards, and they include learning objectives to ensure that the necessary skills and knowledge are developed by a person to enable

him or her to function at an agreed level in an occupation. Education and Training standards are used to define curricula in training institutions. It is however critical that there must be a direct link between the occupational standards and the training standards to respond to demands of the labour market.

In TET delivery, Tanzania adopted the Competency-based Education and Training (CBET) approach. The CBET approach focuses on providing learners with the skills and knowledge required to meet the occupational standards. Occupational standards are thus the starting point for developing Competency-based Education and Training (CBET) programs. TET institutions will be required to benchmark their curricula with relevant occupational standards. Occupational Standards are developed based on a given occupation's current and future demands. As a result, they serve as a means of bridging the gap between the worlds of employment and technical education and training (TET).

The IT Technologist Occupation has its own set of occupational standards. The document explains how the occupational standards were developed, as well as the scope, the occupational profile in the form of DACUM charts, and the Occupational Standards.

2.0 OCCUPATIONAL STANDARD DEVELOPMENT PROCESS

The Occupational standards development process began with an examination of major documents that guide Tanzanian skill development. The 10-year National Skills Development Strategy (2016-2026) was one of the documents reviewed, and it outlined six (6) economic sectors that should be prioritized when developing skills development programmes.

These sectors include: Transport and Logistics, Tourism and Hospitality, Agribusiness, Construction, Energy and ICT. NACTE labour market reports were also

used in the literature review to determine the skills demand in the Tanzanian labour market as a whole.

After the literature review, a workshop comprised of expert practitioners and educators with substantial knowledge and experience in the occupation conducted an occupational analysis utilizing the DACUM approach to produce the occupational profile. The analysis resulted in DACUM Charts, which are attached as **Appendix 1** to this document.

The occupational standards were then developed. Experts in Occupational Analysis and the Development of Occupational Standards facilitated the workshop. Interviews, online surveys, and a stakeholder forum were used to verify and validate the occupational standards. Engineers, supervisory technicians on the job, and experienced IT Technologists were key informants in the survey to discover occupational trends. This information was used to gain insight from the workplaces regarding trends and changes in the profession, including how well graduates are prepared for working in the occupation. A total of …….. online surveys were completed by experts from the labour market across the country. Apart from the survey aiding in defining the scope for the occupational analysis, they served to engage a wide cross-section of experts in the occupation. The stakeholders' forum was attended by …… participants from different parts of the country representing various companies.

3.0 THE SCOPE AND OVERVIEW OF THE OCCUPATION STANDARDS FOR IT TECHNOLOGISTS

These standards cover a broad range of duties and tasks that can be performed by an IT technologist. However, the occupational standards are not meant to replace individual job descriptions, they are to be used for guidance in defining skill levels and knowledge for the IT technologist in specific settings or positions. The IT

technologist may perform tasks in a number of key areas of the occupational standards, but not necessarily in all areas. For example, in large operations other individuals may be employed or designated to perform specific tasks.

An IT technologist orchestrates the technological efficiency of an organization, including managing the computer performance, communications, and networking. IT technologists also work on managing software and hardware technologies, project management, business analysis, IT governance and work with external partners, including vendors, consultants, and agencies, to keep up with system integration. They must always keep up with the latest advancements in technology, as being well informed of these advancements is essential to the on-going development of the business.

These Occupational standards cover the following main duties for an IT technologist:

1. Use ICT governance tools
2. Build small network systems
3. Manage ICT device assets
4. Maintain ICT terminal business software
5. Maintain ICT server system software
6. Manage small ICT project R&D process
7. Implement small ICT project R&D
8. Manage enterprise ICT project engineering implementation process
9. Develop and improve enterprise ICT products
10. Manage enterprise ICT product or service providers
11. Develop ICT tools in an organization
12. Develop an ICT acquisition plan
13. Manage computer systems security
14. Manage user technical support system
15. Manage complex computer networks
16. Introduce emerging ICT solutions

17. Manage cloud computing-based applications and services
18. Evaluate system requirements
19. Evaluate designs of business information systems
20. Manage business information systems
21. Manage ICT projects

These Occupational Standards have been clustered to fit into NACTE qualification levels i.e. NTA Level 7 and Level 8.

4.0 VALIDITY PERIOD

The occupational standards will be valid for 3-5 years due to the fast-changing nature of technology. The review will take the same approach as developing a new standard, based on current labour market information.

5.0 OCCUPATIONAL STANDARDS

5.1 OCCUPATIONAL STANDARDS FOR IT TECHNOLOGIST – NTA 7

OCCUPATION	IT TECHNOLOGIST	**OCCUPATION CODE**	
DUTY TITLE	USE ICT GOVERNANCE TOOLS	**DUTY NO.**	701
TASK TITLE	SELECT ICT GOVERNANCE TOOLS BASED ON ENTERPRISE NEEDS	**TASK NO.**	7011
PERFORMANCE CRITERIA	The person performing this task must be able to recommend ICT governance tools as per industry standards and national ICT governance guidelines.		
RANGE STATEMENT	This task can be performed in an office environment or in a client's office. The following equipment and tools should be available: 1. Computer; 2. Related software and governance tools; 3. Related guides and manuals. This person shall work under minimum supervision.		

EVIDENCE REQUIREMENTS	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Identify ICT governance tools; 2. Select ICT governance tools; 3. Examine the challenges of ICT governance; 4. Recommend appropriate ICT governance tools; 5. Observe health and safety precautions at work; 6. Clean workplace; 7. Store tools as per specifications.	**Detailed knowledge about:** **1.0. Methods:** The person must be able to explain how to: 1.1. Select ICT governance tools; 1.2. Examine ICT governance methods; 1.3. Recommend ICT governance tools that solve practical problems. **2.0. Principles:** The person must be able to explain the principles of: 2.1. Selecting ICT governance tools; 2.2. Interpreting the challenges of ICT governance. **3.0. Theories:** The person must be able to explain: 3.1. Types of ICT governance tools; 3.2. Reports on the challenges faced by ICT governance at work. **4.0. Essential skills:** 4.1. Communication reporting and report writing; 4.2. Analytical and problem-solving skills; 4.3.Solution development skills; 4.4.Leadership skills; 4.5. Understand complex business systems; 4.6. Track new technological trends; 4.7.Strong written and oral communication skills; 4.8.Outstanding interpersonal skills; 4.9. Presentation skills; 4.10.Project management skills.
DESCRIPTION OF END	ICT governance tools are recommended as per industry

PRODUCTS/SERVICE:	standards and national ICT governance guidelines.
CIRCUMSTANTIAL KNOWLEDGE:	**Detailed knowledge about:** 1. ICT device manual; 2. Selection of governance tools; 3. Development of governance solutions.

<table>
<tr><td>OCCUPATION</td><td>IT TECHNOLOGIST</td><td>OCCUPATION CODE</td><td></td></tr>
<tr><td>DUTY TITLE</td><td>USE ICT GOVERNANCE TOOLS</td><td>DUTY NO.</td><td>701</td></tr>
<tr><td>TASK TITLE</td><td>MAINTAIN ICT GOVERNANCE TOOLS</td><td>TASK NO.</td><td>7012</td></tr>
<tr><td>PERFORMANCE CRITERIA</td><td colspan="3">The person performing this task must be able to maintain ICT governance tools as per industry standards and national ICT governance guidelines.</td></tr>
<tr><td>RANGE STATEMENT</td><td colspan="3">This task can be performed in a workshop or in a client's office.
The following equipment and tools should be available:
1. Computer;
2. Relevant software tools;
3. Related guides.
This person shall work under minimum supervision.</td></tr>
<tr><td colspan="4">EVIDENCE REQUIREMENTS</td></tr>
<tr><td colspan="2">PRACTICAL PERFORMANCE</td><td colspan="2">UNDERPINNING KNOWLEDGE</td></tr>
<tr><td colspan="2">The person performing this task must be able to do the following:

1. Maintain ICT governance tool faults;
2. Master fault test analysis methods;
3. Promote ICT governance tools;
4. Train users on ICT governance tools;
5. Prepare work deployment reports;
6. Strictly observe health and safety precautions at work.
7. Clean workplace;
8. Store tools.</td><td colspan="2">Detailed knowledge about:
1.0. Methods:
The person must be able to explain how to:
1.1. Maintain ICT governance tools;
1.2. Promote ICT governance tools;
1.3. Train users on ICT governance tools;
1.4. Prepare work deployment reports.

2.0. Principles:
The person must be able to explain the principles of:
2.1. Using and maintaining ICT governance tools;
2.2. Assessing the risk factors covered by ICT governance tools;
2.3. Analyzing the assessment reports of ICT governance tools.

3.0. Theories:
The person must be able to explain:
3.1. Risk factors covered by ICT governance tools;
3.2. Monitoring the implementation of ICT governance tools.

4.0. Essential skills:
4.1. Problem solving skills;
4.2. Critical thinking skills;
4.3. Analytical skills;
4.4. Communication skills;
4.5. Report writing skills;
4.6. Interpersonal skills;
4.7. Teamwork skills;
4.8. Leadership skills;
4.9. Project management skills;</td></tr>
</table>

	4.10. Time management skills.
DESCRIPTION OF END PRODUCTS/SERVICE:	ICT governance tools are deployed and maintained as per industry standards and national ICT governance guidelines.
CIRCUMSTANTIAL KNOWLEDGE:	**Detailed knowledge about:** 1. Fault detection of ICT governance tools; 2. Fault identification of ICT governance tools; 3. Fault repair of ICT governance tools.

OCCUPATION	IT TECHNOLOGIST	**OCCUPATION CODE**	
DUTY TITLE	USE ICT GOVERNANCE TOOLS	**DUTY NO.**	701
TASK TITLE	BUILD AN AUTOMATED GOVERNANCE SYSTEM	**TASK NO.**	7013
PERFORMANCE CRITERIA	The person performing this task must be able to build automated governance systems as per industry standards and national ICT governance guidelines.		
RANGE STATEMENT	This task can be performed in a workshop, in a machine room or in a client's office. The following equipment and tools should be available: 1. Computer and server; 2. Relevant software tools; 3. Related guides. This person shall work under minimum supervision.		

EVIDENCE REQUIREMENTS

PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Analyze governance needs; 2. Develop automated governance solutions; 3. Write automated governance scripts; 4. Build an automated governance system; 5. Prepare work deployment reports; 6. Strictly observe health and safety precautions at work; 7. Clean workplace; 8. Store tools.	**Detailed knowledge about:** **1.0. Methods:** The person must be able to explain how to: 1.1. Analyze the governance needs in the context of the current ICT situation; 1.2. Develop a governance solution for the needs; 1.3. Build the governance system based on the governance solution; 1.4. Prepare work deployment reports. **2.0. Principles:** The person must be able to explain the principles of: 2.1. Obtaining governance needs; 2.2. Assessing the risk factors covered by the governance system; 2.3. Analyzing the assessment report of the governance system. **3.0. Theories:** The person must be able to explain: 3.1. Risk factors covered by automated governance; 3.2. Monitoring the implementation of automated governance. **4.0. Essential skills:** 4.1. Problem solving skills; 4.2. Critical thinking skills; 4.3. Analytical skills; 4.4. Communication skills; 4.5. Report writing skills; 4.6. Interpersonal skills;

	4.7. Teamwork skills; 4.8. Leadership skills; 4.9. Project management skills; 4.10. Time management skills.
DESCRIPTION OF END PRODUCTS/SERVICE:	The automated governance platform is deployed and maintained as per industry standards and national ICT governance guidelines.
CIRCUMSTANTIAL KNOWLEDGE:	**Detailed knowledge about:** 1. Acquisition of governance needs; 2. Analysis of governance needs; 3. Development of governance solutions; 4. Building of governance platform; 5. Management of the governance platform.

OCCUPATION	IT TECHNOLOGIST	**OCCUPATION CODE**	
DUTY TITLE	USE ICT GOVERNANCE TOOLS	**DUTY NO.**	701
TASK TITLE	USE GOVERNANCE TOOLS TO MANAGE ENTERPRISE ICT SYSTEMS, DEVICES, AND PRODUCTS	**TASK NO.**	7014
PERFORMANCE CRITERIA	The person performing this task must be able to use governance tools to manage enterprise ICT systems, devices, and products.		
RANGE STATEMENT	This task can be performed in a workshop, in a machine room or in a client's office. The following equipment and tools should be available: 1. Computer and other ICT devices; 2. Relevant software tools; 3. Related guides. This person shall work under minimum supervision.		

EVIDENCE REQUIREMENTS

PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Analyze device faults; 2. Develop device configuration plans; 3. Develop an optimal management plan; 4. Implement device management; 5. Prepare work deployment reports; 6. Strictly observe health and safety precautions at work; 7. Clean workplace; 8. Store tools.	**Detailed knowledge about:** **1.0. Methods:** The person must be able to explain how to: 1.1. Configure the device; 1.2. Optimize the device; 1.3. Troubleshoot the equipment; 1.4. Maintain the device. **2.0. Principles:** The person must be able to explain the principles of: 2.1.Accessing to usage options; 2.2.Assessing the risk factors covered in the use; 2.3.Analyzing the evaluation report of the use operation. **3.0. Theories:** The person must be able to explain: 3.1.Risk factors covered in the use of a device; 3.2.Monitoring the operational status in use. **4.0. Essential skills:** 4.1. Problem solving skills; 4.2. Critical thinking skills; 4.3. Analytical skills; 4.4. Communication skills; 4.5. Report writing skills; 4.6. Interpersonal skills; 4.7. Teamwork skills; 4.8. Leadership skills; 4.9. Project management skills;

	4.10. Time management skills.
DESCRIPTION OF END PRODUCTS/SERVICE:	Governance tools are used to manage enterprise ICT systems, devices, and products as per industry standards and national ICT governance guidelines.
CIRCUMSTANTIAL KNOWLEDGE:	**Detailed knowledge about:** 1. Proficient in the use of governance tools; 2. Master the configuration and use of device products; 3. Anticipate possible faults of device products; 4. Propose solutions for faults.

<table>
<tr><td>OCCUPATION</td><td>IT TECHNOLOGIST</td><td>OCCUPATION CODE</td><td></td></tr>
<tr><td>DUTY TITLE</td><td>BUILD SMALL NETWORK SYSTEMS</td><td>DUTY NO.</td><td>702</td></tr>
<tr><td>TASK TITLE</td><td>CONFIGURE THE DEVICE NETWORK ADDRESS AS PER THE NETWORK TOPOLOGY</td><td>TASK NO.</td><td>7021</td></tr>
<tr><td>PERFORMANCE CRITERIA</td><td colspan="3">The person performing this task must be able to configure the network addresses of various types of devices in the LAN as per industry standards and network planning schemes.</td></tr>
<tr><td>RANGE STATEMENT</td><td colspan="3">This task can be completed in an office environment where the network is set up or at a client’s site.
The following items and tools should be available:
1. Reviewed and approved network topology diagram and its description document;
2. Network devices (switches, routers, PCs);
3. Network connection cables.
This person shall work independently.</td></tr>
<tr><td colspan="4">EVIDENCE REQUIREMENTS</td></tr>
<tr><td colspan="2">PRACTICAL PERFORMANCE</td><td colspan="2">UNDERPINNING KNOWLEDGE</td></tr>
<tr><td colspan="2">The person performing this task must be able to do the following:

1. Plan the device network IP address as per the network topology and field cabling;
2. Configure the device network IP address as per the network topology and field cabling.</td><td colspan="2">Detailed knowledge about:
1.0. Methods:
The person must be able to explain how to:
1.1. Configure the IP addresses of the devices in the network;
1.2. Configure the subnet mask of the device in the network;
1.3. Configure the default gateway of the device in the network;
1.4. Configure the DNS server address of the device in the network.

2.0. Principles:
The person must be able to explain the principles of:
2.1.IP address allocation principles.

3.0. Theories:
The person must be able to explain:
3.1.IP address;
3.2.Network address;
3.3.Subnet address;
3.4.Host address;
3.5.Subnet mask.

4.0. Essential skills:
4.1.Problem solving skills;
4.2.Skills to write documents or reports;
4.3.Communication skills;
4.4.Teamwork skills.</td></tr>
</table>

DESCRIPTION OF END PRODUCTS/SERVICE	The network addresses of various types of devices in the LAN are configured as per industry standards and network planning schemes.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. The concept, division, and hierarchy of IP subnets; 2. Definition, value, representation and function of the subnet mask; 3. Supernet technology; 4. Role, hierarchy, representation, and classification of IP address.

OCCUPATION	IT TECHNOLOGIST	**OCCUPATION CODE**	
DUTY TITLE	BUILD SMALL NETWORK SYSTEMS	**DUTY NO.**	702
TASK TITLE	CONFIGURE ROUTING PROTOCOLS AND COMPLETE INTERCONNECTION AS PER THE NETWORK TOPOLOGY	**TASK NO.**	7022
PERFORMANCE CRITERIA	The person performing this task must be able to configure the routing protocols for routers in the LAN as per industry standards and network planning schemes.		
RANGE STATEMENT	This task can be completed in an office environment where the network is set up or at a client's site. The following items and tools should be available: 1. Reviewed and approved network topology diagram and its description document; 2. Network devices (switches, routers, PCs); 3. Network connection cables. This person shall work independently.		

EVIDENCE REQUIREMENTS

PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Clarify network needs as per network topology and field network cabling; 2. Configure static routing; 3. Configure dynamic routing; 4. Check network connectivity by testing IP addresses, gateways and DNS.	Detailed knowledge about: **1.0. Methods:** The person must be able to explain how to: 1.1. Configure static routing; 1.2. Configure default routing; 1.3. Configure the IGRP dynamic protocol; 1.4. Configure the EIGRP dynamic protocol; 1.5. Configure the OSPF dynamic protocol. **2.0. Principles:** The person must be able to explain the principles of: 2.1.Principles of routing; 2.2.Principles of single-switch configuration; 2.3.Principles of double-switch configuration. **3.0. Theories:** The person must be able to explain: 3.1.Router; 3.2.Routing; 3.3.Routing protocols; 3.4.Static routing; 3.5.Dynamic routing. **4.0. Essential skills:** 4.1.Problem solving skills; 4.2.Skills to write documents or reports; 4.3.Communication skills; 4.4.Teamwork skills.

DESCRIPTION OF END PRODUCTS/SERVICE	Routing protocols for routers in the LAN are configured as per industry standards and network planning schemes.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Concepts and specifications of routing and routing protocols; 2. Pros and cons of static and dynamic routing; 3. Dynamic routing protocols including RIP, OSPF, BGP, MPLS.

OCCUPATION	IT TECHNOLOGIST	**OCCUPATION CODE**	
DUTY TITLE	BUILD SMALL NETWORK SYSTEMS	**DUTY NO.**	702
TASK TITLE	BASIC SECURITY CONFIGURATION OF NETWORK DEVICES	**TASK NO.**	7023
PERFORMANCE CRITERIA	The person performing this task must be able to perform basic security configuration of the devices in the network as per industry standards and network planning schemes.		
RANGE STATEMENT	This task can be completed in an office environment where the network is set up or at a client's site. The following items and tools should be available: 1. Reviewed and approved network topology diagram and its description document; 2. Network devices (switches, routers, PCs); 3. Network connection cables. This person shall work independently.		

EVIDENCE REQUIREMENTS

PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Assess potential risks to the network; 2. Perform security protection and virus searching and scanning of network devices; 3. Install, set up and monitor firewalls; 4. Divide the virtual network on the switch to achieve network isolation; 5. Security configuration and management of network devices.	Detailed knowledge about: **1.0. Methods:** The person must be able to explain how to: 1.1. Prevent and remove LAN viruses; 1.2. Use Trojan horse virus searching and killing tools; 1.3. Enable and set up firewalls; 1.4. Remove unwanted protocols from the LAN. **2.0. Principles:** The person must be able to explain the principles of: 2.1. Rules for the safe use of computers in LANs; 2.2. LAN network security management specifications. **3.0. Theories:** The person must be able to explain: 3.1.Virus; 3.2.Network security; 3.3.Information security; 3.4.Firewall. **4.0. Essential skills:** 4.1.Problem solving skills; 4.2.Skills to write documents or reports; 4.3.Communication skills; 4.4.Teamwork skills.
DESCRIPTION OF END PRODUCTS/SERVICE	The devices in the network are configured for basic security as per industry standards and network planning schemes.

CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Methods of preventing and removing viruses from LANs; 2. Installation, setting and enabling of LAN firewalls; 3. LAN security setup policies and methods.

OCCUPATION	IT TECHNOLOGIST	**OCCUPATION CODE**	
DUTY TITLE	BUILD SMALL NETWORK SYSTEMS	**DUTY NO.**	702
TASK TITLE	DIAGNOSE AND RESOLVE SIMPLE NETWORK FAULTS AND MAINTAIN NORMAL OPERATION OF NETWORK SERVICES	**TASK NO.**	7024
PERFORMANCE CRITERIA	The person performing this task must be able to diagnose the cause of network faults and maintain them effectively as per industry standards and network planning schemes.		
RANGE STATEMENT	This task can be completed in an office environment where the network is set up or at a client's site. The following items and tools should be available: 1. Reviewed and approved network topology diagram and its description document; 2. Network devices (switches, routers, PCs); 3. Network connection cables. This person shall work independently.		

EVIDENCE REQUIREMENTS	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Network hardware fault location and cause analysis; 2. Identify network service configuration management faults; 3. Develop fault solutions; 4. Troubleshoot network.	Detailed knowledge about: **1.0. Methods:** The person must be able to explain how to: 1.1. Analyze the cause of the fault as per the LAN fault; 1.2. Take solutions to problems based on LAN faults. **2.0. Principles:** The person must be able to explain the principles of: 2.1.Basic principles for solving network fault problems. **3.0. Theories:** The person must be able to explain: 3.1.Network fault; 3.2.Connection fault; 3.3.Network card fault; 3.4.Network virus fault. **4.0. Essential skills:** 4.1.Problem solving skills; 4.2.Skills to write documents or reports; 4.3.Communication skills; 4.4.Teamwork skills.
DESCRIPTION OF END PRODUCTS/SERVICE	The causes of network faults are diagnosed and effectively maintained as per industry standards and

	network planning schemes.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Solutions to network blockage fault; 2. Solutions to network connection fault; 3. Solutions to network card fault; 4. Solutions to virus fault.

OCCUPATION	IT TECHNOLOGIST	**OCCUPATION CODE**	
DUTY TITLE	BUILD SMALL NETWORK SYSTEMS	**DUTY NO.**	702
TASK TITLE	PREPARE AND MANAGE NETWORK SYSTEM MAINTENANCE REPORTS	**TASK NO.**	7025
PERFORMANCE CRITERIA	The person performing this task must be able to prepare and manage network system maintenance reports as per industry standards and network planning schemes.		
RANGE STATEMENT	This task can be completed in an office environment where the network is set up or at a client's site. The following items and tools should be available: 1. Reviewed and approved the network topology diagram and its description document; 2. Network devices (switches, routers, PCs); 3. Network connection cables; 4. Common office software. This person shall work independently.		

EVIDENCE REQUIREMENTS	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Record and analyze system maintenance logs; 2. Prepare network system maintenance reports; 3. Prepare network system maintenance plans.	Detailed knowledge about: **1.0. Methods:** The person must be able to explain how to: 1.1. Record network system routine maintenance logs; 1.2. Analyze network system routine maintenance logs; 1.3. Prepare network system maintenance reports. **2.0. Principles:** The person must be able to explain the principles of: 2.1. Principles of network system maintenance; 2.2. Reporting principles for network system maintenance. **3.0. Theories:** The person must be able to explain: 3.1. Network governance; 3.2. Network management; 3.3. Network governance logs; 3.4. Network governance reports. **4.0. Essential skills:** 4.1. Problem solving skills; 4.2. Skills to write documents or reports;

	4.3. Communication skills; 4.4. Teamwork skills.
DESCRIPTION OF END PRODUCTS/SERVICE	Network system maintenance reports are prepared and managed as per industry standards and network planning schemes.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Recording and analysis of network governance logs; 2. Preparation of network governance reports; 3. Network governance programs.

OCCUPATION	IT TECHNOLOGIST	**OCCUPATION CODE**	
DUTY TITLE	MANAGE ICT DEVICE ASSETS	**DUTY NO.**	703
TASK TITLE	PROCURE AND ACCEPT ICT DEVICES	**TASK NO.**	7031
PERFORMANCE CRITERIA	The person performing this task must be able to procure and accept ICT devices as per industry standards and national ICT guidelines.		
RANGE STATEMENT	This task can be performed in a machine room or in a client's office. The following equipment and tools should be available: 1. Computer; 2. Relevant software tools; 3. Related guides. This person shall work under minimum supervision.		

EVIDENCE REQUIREMENTS	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Conduct ICT device requirement analysis; 2. Develop an ICT device procurement plan; 3. Be familiar with the procurement bidding process and related policies; 4. Prepare ICT device procurement contracts; 5. Prepare ICT acceptance plan; 6. Observe health and safety precautions at work; 7. Clean workplace; 8. Store tools.	**Detailed knowledge about:** **1.0. Methods:** The person must be able to explain how to: 1.1. Conduct ICT device requirement analysis; 1.2. Develop an ICT device procurement plan; 1.3. Accept ICT device. **2.0. Principles:** The person must be able to explain the principles of: 2.1. Procurement bidding process and related policies; 2.2. ICT acceptance plan. **3.0. Theories:** The person must be able to explain: 3.1. Qualification examination of ICT device suppliers; 3.2. ICT device procurement technical specifications, parameters and requirements; 3.3. ICT device acceptance criteria; 3.4. Non-conformance resolution mechanism for ICT device acceptance. **4.0. Essential skills:** 4.1. Problem solving skills; 4.2. Critical thinking skills; 4.3. Analytical skills; 4.4. Communication skills; 4.5. Procurement requirement report writing skills;

	4.6. Procurement contract writing skills; 4.7. ICT acceptance report writing skills; 4.8. Interpersonal skills; 4.9. Teamwork skills; 4.10 Leadership skills.
DESCRIPTION OF END PRODUCTS/SERVICE	The procurement parameters for common ICT devices are given and the procured devices are evaluated for conformity under normal operating conditions as per industry standards and national ICT governance guidelines.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Be able to clarify the specifications, models and functions of the ICT devices procured, and technical agreements; 2. During ICT device acceptance: device manual, certificate of conformity, inspection certificate, packing list and accompanying spare parts and accessories.

<table>
<tr><td>OCCUPATION</td><td>IT TECHNOLOGIST</td><td>OCCUPATION CODE</td><td></td></tr>
<tr><td>DUTY TITLE</td><td>MANAGE ICT DEVICE ASSETS</td><td>DUTY NO.</td><td>703</td></tr>
<tr><td>TASK TITLE</td><td>MAINTAIN ICT ASSET INVENTORY</td><td>TASK NO.</td><td>7032</td></tr>
<tr><td>PERFORMANCE CRITERIA</td><td colspan="3">The person performing this task must be able to maintain an inventory of ICT assets as per industry standards and national ICT guidelines.</td></tr>
<tr><td>RANGE STATEMENT</td><td colspan="3">This task can be performed in a machine room or in a client’s office.
The following equipment and tools should be available:
1. Computer;
2. Barcode reader;
3. Relevant software tools.
This person shall work independently.</td></tr>
<tr><td colspan="4">EVIDENCE REQUIREMENTS</td></tr>
<tr><td colspan="2">PRACTICAL PERFORMANCE</td><td colspan="2">UNDERPINNING KNOWLEDGE</td></tr>
<tr><td colspan="2">The person performing this task must be able to do the following:

1. Be familiar with the regulations related to asset management;
2. Daily management of ICT assets;
3. ICT asset inventory;
4. ICT asset depreciation management;
5. ICT asset statement management.</td><td colspan="2">Detailed knowledge about:
1.0. Methods:
The person must be able to explain how to:
1.1. Maintain a list of ICT assets;
1.2. Record ICT routine maintenance logs;
1.3. Perform maintenance on the device involved.

2.0. Principles:
The person must be able to explain the principles of:
2.1. Maintenance logs for device faults;
2.2. ICT maintenance checklist.

3.0. Theories:
The person must be able to explain:
3.1. Content of the ICT asset inventory;
3.2. ICT routine maintenance log method.

4.0. Essential skills:
4.1. Problem solving skills;
4.2. Analytical skills;
4.3. Communication skills;
4.4. Interpersonal skills;
4.5. Teamwork skills;
4.6. Time management skills.</td></tr>
<tr><td colspan="2">DESCRIPTION OF END PRODUCTS/SERVICE</td><td colspan="2">Managed ICT devices are managed such as inventory, and the asset list is dynamically managed and maintained as per industry standards</td></tr>
</table>

	and national ICT governance guidelines.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. ICT routine maintenance log; 2. Maintenance of switches, routers, PCs.

OCCUPATION	IT TECHNOLOGIST	**OCCUPATION CODE**	
DUTY TITLE	MANAGE ICT DEVICE ASSETS	**DUTY NO.**	703
TASK TITLE	SIMPLY REPAIR COMMON FAULTS OF ICT DEVICES	**TASK NO.**	7033
PERFORMANCE CRITERIA	The person performing this task must be able to repair and resolve common faults of ICT devices as per industry standards and national ICT guidelines.		
RANGE STATEMENT	This task can be performed in a machine room or in a client's office. The following equipment and tools should be available: 1. System documentation; 2. Computer; 3. Relevant software tools; 4. IT technologist toolkit. This person shall work independently.		

EVIDENCE REQUIREMENTS

PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Describe device faults; 2. Identify the specific type of network; 3. Test and repair ICT device; 4. Observe health and safety precautions at work; 5. Clean workplace; 6. Store tools.	**Detailed knowledge about:** **1.0. Methods:** The person must be able to explain how to: 1.1. Identify the type of device; 1.2. Troubleshoot; 1.3. Perform repair on the device involved; 1.4. Test the repaired or replaced device for proper operation. **2.0. Principles:** The person must be able to explain the principles of: 2.1 Device incident handling; 2.2 Device fault diagnosis. **3.0. Theories:** The person must be able to explain: 3.1. Types of common ICT device faults; 3.2. Common ICT device troubleshooting and repair methods. **4.0. Essential skills:** 4.1. Problem solving skills; 4.2. Critical thinking skills; 4.3. Analytical skills; 4.4. Communication skills; 4.5. Troubleshooting skills; 4.6. Fault correcting skills; 4.7. Report writing skills;

	4.8. Interpersonal skills; 4.9. Teamwork skills.
DESCRIPTION OF END PRODUCTS/SERVICE	General faults of common ICT devices are detected and resolved as per industry standards and national ICT governance guidelines.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Computer network card fault detection; 2. Whether the router is faulty and the general troubleshooting method; 3. Whether the switch is faulty and the general troubleshooting method.

OCCUPATION	IT TECHNOLOGIST	**OCCUPATION CODE**	
DUTY TITLE	MANAGE ICT DEVICE ASSETS	**DUTY NO.**	703
TASK TITLE	EVALUATE ICT DEVICE SCRAP CONDITIONS AND MAKE DISPOSAL RECOMMENDATIONS FOR SCRAP DEVICES	**TASK NO.**	7034
PERFORMANCE CRITERIA	The person performing this task must be able to evaluate whether the corresponding devices have reached scrap conditions and be able to give disposal recommendations for scrap devices as per industry standards and national ICT guidelines.		
RANGE STATEMENT	This task can be performed in a workshop or in a client's office. The following equipment and tools should be available: 1. Computer; 2. Barcode reader; 3. Relevant software tools; 4. This person shall complete the work independently. This person shall work independently.		

EVIDENCE REQUIREMENTS

PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Be familiar with ICT device scrap regulations and processes; 2. Assess the conditions for ICT device scrap; 3. Prepare recommendations for the disposal of ICT device scrap; 4. Observe health and safety precautions at work; 5. Clean workplace; 6. Store tools.	**Detailed knowledge about:** **1.0. Methods:** The person must be able to explain how to: 1.1. Identify the type of device; 1.2. Time conditions for device scrap; 1.3. Device fault rate conditions; 1.4. Aging device and energy consumption do not meet the relevant management standards; 1.5. Conditions in which major components cannot be replaced; 1.6. Conditions that the original manufacturer no longer provides technical support and the performance of the device declines sharply. **2.0. Principles:** The person must be able to explain the principles of: 2.1. Devices and facilities scrap criteria; 2.2. Devices and facilities disposal recommendations. **3.0. Theories:**

	The person must be able to explain: 3.1. Common ICT device scrap conditions; 3.2. Disposal recommendations for common ICT device scrap. **4.0. Essential skills:** 4.1. Problem solving skills; 4.2. Critical thinking skills; 4.3. Analytical skills; 4.4. Communication skills; 4.5. Skills to calculate device scrap conditions; 4.6. Skills to recommend the disposal of device scrap; 4.7. Report writing skills; 4.8. Interpersonal skills.
DESCRIPTION OF END PRODUCTS/SERVICE	Whether common ICT devices meet scrap conditions is determined, and disposal recommendations are given for the relevant devices to be disposed of, as per industry standards and national ICT governance guidelines.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Calculation of the service life of different devices; 2. Calculation method for repair or upgrade costs greater than 80% of the device value; 3. Calculation and statistical method of device fault rate; 4. Reasons why major parts of the device cannot be replaced; 5. Donation method for device disposal; 6. Method of removing device parts for device disposal; 7. Method of selling the device for device disposal.

OCCUPATION	IT TECHNOLOGIST	**OCCUPATION CODE**	
DUTY TITLE	MANAGE ICT DEVICE ASSETS	**DUTY NO.**	703
TASK TITLE	MANAGE ICT DEVICE APPURTENANCES SUCH AS LICENSES, SUPPLIER SERVICE AGREEMENTS, QUALITY ASSURANCE	**TASK NO.**	7035
PERFORMANCE CRITERIA	The person performing this task must be able to maintain ICT system licenses and assess the implementation of service agreements as per contracts, industry standards and national ICT guidelines.		
RANGE STATEMENT	This task can be performed in a workshop or in a client's office. The following equipment and tools should be available: 1. Manufacturers' manuals; 2. Computer; 3. IT technologist toolkit; 4. Relevant software tools. This person shall complete the work independently.		

EVIDENCE REQUIREMENTS	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Identification of ICT device appurtenances; 2. Daily management of ICT device appurtenances; 3. Disposal of ICT device appurtenances.	Detailed knowledge about: **1.0. Methods:** The person must be able to explain how to: 1.1.Collect license information; 1.2.Identify license attributes; 1.3.Monitor license usage; 1.4.Track license expiration and renewal; 1.5.Measure service elements. **2.0. Principles:** The person must be able to explain the principles of: 2.1.Maintaining ICT system licenses; 2.2.Maintaining service agreements; 2.3.Monitoring and evaluation of ICT services. **3.0. Theories:** The person must be able to explain: 3.1.Types of ICT assets and their functions; 3.2.Types of ICT system licenses; 3.3.Types of services and their performance valuation; 3.4.Types of service elements; 3.5.Types of service agreements and their criteria.

	4.0. Essential skills: 4.1.Problem solving skills; 4.2.Critical thinking skills; 4.3.Analytical skills; 4.4.Communication skills; 4.5.Report writing skills; 4.6.Interpersonal skills; 4.7.Teamwork skills; 4.8.Leadership skills; 4.9.Project management skills; 4.10.Time management skills.
DESCRIPTION OF END PRODUCTS/SERVICE	ICT system licenses are maintained and implementation of service agreements is assessed as per contracts, industry standards and national ICT guidelines.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Devices and tools for safe operation; 2. Types of licenses; 3. Use and renewals of licenses; 4. ICT service types and elements; 5. ICT service agreement types and standards; 6. Analysis and evaluation of service implementation reports and documentation of service results.

OCCUPATION	IT TECHNOLOGIST	**OCCUPATION CODE**	
DUTY TITLE	MANAGE ICT DEVICE ASSETS	**DUTY NO.**	703
TASK TITLE	TAKE INVENTORY OF ICT ASSETS IN THE AREA UNDER JURISDICTION AND OUTPUT THE CORRESPONDING REPORTS	**TASK NO.**	7036
PERFORMANCE CRITERIA	The person performing this task must be able to prepare an inventory of ICT assets as per industry standards and national ICT guidelines.		
RANGE STATEMENT	This task can be performed in a workshop or in a client's office. The following equipment and tools should be available: 1. Computer; 2. Barcode reader; 3. Relevant software tools. This person shall work together with the personnel of the centralized management department and the personnel who use the assets to complete the work.		

EVIDENCE REQUIREMENTS	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Identify ICT assets; 2. Collect details of ICT system assets; 3. Record detailed information.	Detailed knowledge about: **1.0. Methods:** The person must be able to explain how to: 1.1.Handle procedures for acquisition, change and disposal of ICT device assets; 1.2.Establish ICT device asset files; 1.3.Manage the accounts, cards and vouchers of ICT device assets; 1.4.Prepare ICT device asset statements; 1.5.Decompose ICT device assets; 1.6.Interpret ICT device asset codes; 1.7.Assemble ICT assets. **2.0. Principles:** The person must be able to explain the principles of: 2.1.Managing ICT assets; 2.2.Procuring ICT assets; 2.3.Coding of ICT assets. **3.0. Theories:** The person must be able to explain: 3.1.Types of ICT assets and their functions.

	4.0. Essential skills: 4.1.Problem solving skills; 4.2.Critical thinking skills; 4.3. Analytical skills; 4.4.Communication skills; 4.5.Report writing skills; 4.6.Interpersonal skills; 4.7.Teamwork skills; 4.8.Leadership skills; 4.9.Project management skills; 4.10.Time management skills.
DESCRIPTION OF END PRODUCTS/SERVICE	An inventory of ICT assets is developed as per industry standards and national ICT guidelines.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Safe operation of devices and tools; 2. Types of ICT assets; 3. Process of ICT asset acquisition, change, and disposal; 4. Preparation of ICT asset files and reports; 5. Management of ICT assets' accounts, cards and vouchers; 6. Coding of ICT assets.

OCCUPATION	IT TECHNOLOGIST	**OCCUPATION CODE**	
DUTY TITLE	MAINTAIN ICT TERMINAL SERVICE SOFTWARE	**DUTY NO.**	704
TASK TITLE	INSTALL, UPGRADE AND UNINSTALL COMMON ICT TERMINAL SERVICE SOFTWARE	**TASK NO.**	7041
PERFORMANCE CRITERIA	The person performing this task must be able to install, upgrade, and uninstall common ICT terminal service software as per industry standards and national ICT guidelines.		
RANGE STATEMENT	This task can be completed in an office environment or at a client site. The following equipment and tools should be available: 1. System documentation; 2. Computer; 3. Relevant software tools; 4. IT technologist toolkit. This person shall complete the work independently.		

EVIDENCE REQUIREMENTS	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Install common ICT terminal service software; 2. Determine the requirements for upgrading the common ICT terminal service software; 3. Install the upgraded ICT terminal service software; 4. Uninstall common ICT terminal service software; 5. Observe health and safety precautions at work; 6. Clean workplace; 7. Store tools.	Detailed knowledge about: **1.0. Methods:** The person must be able to explain how to: 1.1. Install common ICT terminal service software; 1.2. Determine the requirements for upgrading the common ICT terminal service software; 1.3. Install the upgraded ICT terminal service software; 1.4. Uninstall common ICT terminal service software. **2.0. Principles:** The person must be able to explain the principles of: 2.1.Installing ICT terminal service software; 2.2.Upgrading ICT terminal service software; 2.3.Uninstalling ICT terminal service software. **3.0. Theories:** The person must be able to explain: 3.1.Installing ICT terminal service software version; 3.2.Determining the requirements for upgrading the common ICT terminal service software; 3.3.Installing the upgraded ICT terminal service

	software version; 3.4.Uninstalling common ICT terminal service software. **4.0. Essential skills:** 4.1.Problem solving skills; 4.2.Critical thinking skills; 4.3.Analytical skills; 4.4.Communication skills; 4.5.Report writing skills; 4.6.Interpersonal skills; 4.7.Teamwork skills; 4.8.Leadership skills; 4.9.Project management skills; 4.10.Time management skills.
DESCRIPTION OF END PRODUCTS/SERVICE	Common ICT terminal service software is installed, upgraded, and uninstalled as per industry standards and national ICT guidelines.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Installation of ICT terminal service software version and requirements; 2. Installation of the upgraded ICT terminal service software version and requirements; 3. Uninstallation of ICT terminal service software.

OCCUPATION	IT TECHNOLOGIST	**OCCUPATION CODE**	
DUTY TITLE	MAINTAIN ICT TERMINAL SERVICE SOFTWARE	**DUTY NO.**	704
TASK TITLE	CONFIGURE AND USE COMMON ICT TERMINAL SERVICE SOFTWARE	**TASK NO.**	7042
PERFORMANCE CRITERIA	The person performing this task must be able to configure and use common ICT terminal service software as per industry standards and national ICT guidelines.		
RANGE STATEMENT	This task can be completed in an office environment or at a client site. The following equipment and tools should be available: 1. System documentation; 2. Computer; 3. Relevant software tools; 4. IT technologist toolkit. This person shall complete the work independently.		

EVIDENCE REQUIREMENTS

PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Identify common ICT terminal service software requirements; 2. Identify the functional modules of the terminal service software; 3. Automate the deployment configuration of each functional module; 4. Test the functional modules of the terminal service software; 5. Use the basic functions of the terminal service software; 6. Observe health and safety precautions at work; 7. Clean workplace; 8. Store tools.	Detailed knowledge about: **1.0. Methods:** The person must be able to explain how to: 1.1. Identify common ICT terminal service software requirements; 1.2. Identify the functional modules of the terminal service software; 1.3. Automate the deployment configuration of each functional module; 1.4. Test the functional modules of the terminal service software; 1.5. Use the basic functions of the terminal service software. **2.0. Principles:** The person must be able to explain the principles of: 2.1.Configuring ICT terminal service software; 2.2.Using ICT terminal service software. **3.0. Theories:** The person must be able to explain: 3.1.Common ICT terminal service software requirements; 3.2.Common ICT terminal service software functional modules; 3.3.Process of using common ICT terminal service software.

	4.0. Essential skills: 4.1.Problem solving skills; 4.2.Critical thinking skills; 4.3.Analytical skills; 4.4.Communication skills; 4.5.Report writing skills; 4.6.Interpersonal skills; 4.7.Teamwork skills; 4.8.Leadership skills; 4.9.Project management skills; 4.10.Time management skills.
DESCRIPTION OF END PRODUCTS/SERVICE	Common ICT terminal service software is configured and used as per industry standards and national ICT guidelines.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Common ICT terminal service software requirements and functions; 2. Common ICT terminal service software configuration process; 3. Process of using common ICT terminal service software.

OCCUPATION	IT TECHNOLOGIST	**OCCUPATION CODE**	
DUTY TITLE	MAINTAIN ICT TERMINAL SERVICE SOFTWARE	**DUTY NO.**	704
TASK TITLE	DIAGNOSE AND RESOLVE SIMPLE ICT TERMINAL SERVICE SOFTWARE FAULTS	**TASK NO.**	7043
PERFORMANCE CRITERIA	The person performing this task must be able to diagnose and resolve simple ICT terminal service software faults as per industry standards and national ICT guidelines.		
RANGE STATEMENT	This task can be completed in an office environment or at a client site. The following equipment and tools should be available: 1. System documentation; 2. Computer; 3. Relevant software tools; 4. IT technologist toolkit. This person can work independently or communicate and cooperate with colleagues to complete the work.		

EVIDENCE REQUIREMENTS	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Diagnose ICT terminal service software fault; 2. Restore ICT terminal service software; 3. Test the restored ICT terminal service software; 4. Use ICT terminal service software; 5. Observe health and safety precautions at work; 6. Clean workplace; 7. Store tools.	Detailed knowledge about: **1.0. Methods:** The person must be able to explain how to: 1.1. Diagnose ICT terminal service software fault; 1.2. Restore ICT terminal service software; 1.3. Test the restored ICT terminal service software; 1.4. Use ICT terminal service software. **2.0. Principles:** The person must be able to explain the principles of: 2.1.Diagnosing ICT terminal service software fault; 2.2.Testing the restored ICT terminal service software. **3.0. Theories:** The person must be able to explain: 3.1.How to diagnose ICT terminal service software fault; 3.2.How to test the restored ICT terminal service software. **4.0. Essential skills:**

	4.1.Problem solving skills; 4.2.Critical thinking skills; 4.3.Analytical skills; 4.4.Communication skills; 4.5.Report writing skills; 4.6.Interpersonal skills; 4.7.Teamwork skills; 4.8.Leadership skills; 4.9.Project management skills; 4.10.Time management skills.
DESCRIPTION OF END PRODUCTS/SERVICE	Simple ICT terminal service software faults are diagnosed and resolved as per industry standards and national ICT guidelines.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Diagnose ICT terminal service software fault; 2. Test the restored ICT terminal service software.

OCCUPATION	IT TECHNOLOGIST	**OCCUPATION CODE**	
DUTY TITLE	MAINTAIN ICT SERVER SYSTEM SOFTWARE	**DUTY NO.**	705
TASK TITLE	INSTALLATION OF SERVER OPERATING SYSTEMS AND SERVER CONFIGURATION AND MANAGEMENT	**TASK NO.**	7051
PERFORMANCE CRITERIA	The person performing this task must be able to install server operating systems, configure and manage servers as per industry standards and national ICT guidelines.		
RANGE STATEMENT	This task can be performed in a workshop or in a client's office. The following equipment and tools should be available: 1. System documentation; 2. Computer; 3. Relevant software tools; 4. IT technologist toolkit. This person can work independently or communicate and cooperate with colleagues to complete the work.		

EVIDENCE REQUIREMENTS	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Install the ICT server OS; 2. Configure the server network; 3. Configure server firewall; 4. Observe health and safety precautions at work; 5. Clean workplace; 6. Store tools.	**Detailed knowledge about:** **1.0. Methods:** The person must be able to explain how to: 1.1. Install the ICT server OS; 1.2. Configure the server network; 1.3. Configure server firewall. **2.0. Principles:** The person must be able to explain the principles of: 2.1. ICT server OS installation steps; 2.2. ICT server configuration and management. **3.0. Theories:** The person must be able to explain: 3.1. Disk partitioning methods; 3.2. Network connection methods; 3.3. Firewall setup rules. **4.0. Essential skills:** 4.1. Problem solving skills; 4.2. Critical thinking skills; 4.3. Analytical skills; 4.4. Communication skills; 4.5. Report writing skills;

	4.6. Interpersonal skills; 4.7. Teamwork skills; 4.8. Leadership skills; 4.9. Project management skills; 4.10. Time management skills.
DESCRIPTION OF END PRODUCTS/SERVICE	The server operating system is installed and the server is configured and managed as per industry standards and national ICT guidelines.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Installation of operating system; 2. Configuration of the network; 3. Management of security services; 4. Disk partitioning methods.

OCCUPATION	IT TECHNOLOGIST	**OCCUPATION CODE**	
DUTY TITLE	MAINTAIN ICT SERVER SYSTEM SOFTWARE	**DUTY NO.**	705
TASK TITLE	INSTALL, UPGRADE AND UNINSTALL ICT SERVER SYSTEM SOFTWARE	**TASK NO.**	7052
PERFORMANCE CRITERIA	The person performing this task must be able to install, upgrade, and uninstall ICT server system software as per industry standards and national ICT guidelines.		
RANGE STATEMENT	This task can be performed in a workshop or in a client's office. The following equipment and tools should be available: 1. System documentation; 2. Computer; 3. Relevant software tools; 4. IT technologist toolkit. This person shall work independently.		

EVIDENCE REQUIREMENTS	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Install the ICT server system software; 2. Upgrade the ICT server system software; 3. Uninstall the ICT server system software; 4. Observe health and safety precautions at work; 5. Clean workplace; 6. Store tools.	**Detailed knowledge about:** **1.0. Methods:** The person must be able to explain how to: 1.1. Remote login to the ICT server OS; 1.2. Operate the server using a scripting language; 1.3. Perform data backup; 1.4. Install, upgrade, and uninstall ICT server system software; 1.5. Test the installed, upgraded or uninstalled ICT server system software. **2.0. Principles:** The person must be able to explain the principles of: 2.1. Installation, upgrade, and uninstallation of business server system software; 2.2. Testing the installed, upgraded or uninstalled system software; 2.3. Performing data backup and restore. **3.0. Theories:** The person must be able to explain: 3.1. ICT server system software installation, upgrade and uninstallation; 3.2. Software library; 3.3. Scripting languages; 3.4. Data backup.

	4.0. Essential skills: 4.1. Problem solving skills; 4.2. Critical thinking skills; 4.3. Analytical skills; 4.4. Communication skills; 4.5. Report writing skills; 4.6. Interpersonal skills; 4.7. Teamwork skills; 4.8. Leadership skills; 4.9. Project management skills; 4.10. Time management skills.
DESCRIPTION OF END PRODUCTS/SERVICE	ICT server system software is installed, upgraded, and uninstalled as per industry standards and national ICT guidelines.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Requirements for installing, upgrading, and uninstalling ICT server system software; 2. Data security handling; 3. Data backup methods; 4. Scripting language commands.

OCCUPATION	IT TECHNOLOGIST	**OCCUPATION CODE**	
DUTY TITLE	MAINTAIN ICT SERVER SYSTEM SOFTWARE	**DUTY NO.**	705
TASK TITLE	CONFIGURE AND USE ICT SERVER SYSTEM SOFTWARE	**TASK NO.**	7053
PERFORMANCE CRITERIA	The person performing this task must be able to configure and use ICT server system software as per industry standards and national ICT guidelines.		
RANGE STATEMENT:	This task can be performed in a workshop or in a client's office. The following equipment and tools should be available: 1. System documentation; 2. Computer; 3. Relevant software tools; 4. IT technologist toolkit. This person can work independently or communicate and cooperate with colleagues to complete the work.		

EVIDENCE REQUIREMENTS

PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Configure ICT server system software; 2. Use ICT server system software; 3. Observe health and safety precautions at work; 4. Clean workplace; 5. Store tools.	**Detailed knowledge about:** **1.0. Methods:** The person must be able to explain how to: 1.1. Remote login to the server; 1.2. Use scripting language to operate the server; 1.3. Configure ICT server system software; 1.4. Test the configured server system software; 1.5. Use server system software. **2.0. Principles:** The person must be able to explain the principles of: 2.1. Configuration of the ICT server system s oftware; 2.2. Use of the ICT server system software. **3.0. Theories:** The person must be able to explain: 3.1 Types of ICT server system software; 3.1 Configuration requirements for ICT server system software; 3.1 Scripting language; 3.1 Use of ICT server system software; 3.1 Data backup.

	4.0. Essential skills: 4.1. Problem solving skills; 4.2. Critical thinking skills; 4.3. Analytical skills; 4.4. Communication skills; 4.5. Report writing skills; 4.6. Interpersonal skills; 4.7. Teamwork skills; 4.8. Leadership skills; 4.9. Project management skills; 4.10. Time management skills.
DESCRIPTION OF END PRODUCTS/SERVICE	ICT server system software is configured and used as per industry standards and national ICT guidelines.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Types of ICT server system software; 2. Configuration requirements for ICT server system software; 3. How to use ICT server system software; 4. Backup and secure handling of server data.

OCCUPATION	IT TECHNOLOGIST	**OCCUPATION CODE**	
DUTY TITLE	MAINTAIN ICT SERVER SYSTEM SOFTWARE	**DUTY NO.**	705
TASK TITLE	DIAGNOSE AND RESOLVE SIMPLE SERVER SYSTEM SOFTWARE FAULTS	**TASK NO.**	7054
PERFORMANCE CRITERIA	The person performing this task must be able to diagnose and resolve simple server system software faults as per industry standards and national ICT guidelines.		
RANGE STATEMENT:	This task can be performed in a workshop or in a client's office. The following equipment and tools should be available: 1. System documentation; 2. Computer; 3. Relevant software tools; 4. IT technologist toolkit. This person shall work independently.		

EVIDENCE REQUIREMENTS	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Diagnose server system software; 2. Troubleshoot server system software; 3. Test restored server system software; 4. Observe health and safety precautions at work; 5. Clean workplace; 6. Store tools.	**Detailed knowledge about:** **1.0. Methods:** The person must be able to explain how to: 1.4. Diagnose server system software; 1.5. Troubleshoot server system software; 1.6. Test restored server system software; 1.7. Interpret measurements of diagnostic tools; **2.0. Principles:** The person must be able to explain the principles of: 2.1. Troubleshooting server system software; 2.2. Testing restored server system software. **3.0. Theories:** The person must be able to explain: 3.1. Types of server system software; 3.2. Types of troubleshooting tools and their functions; 3.3. Server system software evaluation methods; 3.4. Server system software settings and their functions. **4.0.Essential skills:** 4.1. Problem solving skills; 4.2. Critical thinking skills; 4.3. Analytical skills;

	4.4. Communication skills; 4.5. Report writing skills; 4.6. Interpersonal skills; 4.7. Teamwork skills; 4.8. Leadership skills; 4.9. Project management skills; 4.10. Time management skills.
DESCRIPTION OF END PRODUCTS/SERVICE	Simple server system software faults are diagnosed and resolved as per industry standards and national ICT guidelines.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Types of server system software; 2. Server system software troubleshooting; 3. Data backup and restoration methods.

OCCUPATION	IT TECHNOLOGIST	**OCCUPATION CODE**	
DUTY TITLE	MAINTAIN ICT SERVER SYSTEM SOFTWARE	**DUTY NO.**	705
TASK TITLE	BUILD AND PROVIDE A REMOTE MAINTENANCE ENVIRONMENT FOR SERVER SYSTEMS	**TASK NO.**	7055
PERFORMANCE CRITERIA	The person performing this task must be able to configure and use ICT server system software as per industry standards and national ICT guidelines.		
RANGE STATEMENT	This task can be performed in a workshop or in a client's office. The following equipment and tools should be available: 1. System documentation; 2. Computer; 3. Relevant software tools; 4. IT technologist toolkit. This person can work independently or communicate and cooperate with colleagues to complete the work.		

EVIDENCE REQUIREMENTS

PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Build the remote server environment; 2. Configure the remote maintenance environment of the server system; 3. Observe health and safety precautions at work; 4. Clean workplace; 5. Store tools.	**Detailed knowledge about:** **1.0. Methods:** The person must be able to explain how to: 1.1. Build the remote server environment; 1.2. Operate servers using a scripting language; 1.3. Configure the remote maintenance environment of the server system; 1.4. Test the remote maintenance environment of a configured server system. **2.0. Principles:** The person must be able to explain the principles of: 2.1. Building the remote server environment; 2.2. Configuration of the remote maintenance environment of the server system; 2.3. Performing data restoration and backup. **3.0. Theories:** The person must be able to explain: 3.1 Configuration requirements for the remote environment of the ICT server system; 3.2 Building of ICT server system remote environment; 3.3 Testing of ICT server system remote environment; 3.4 Troubleshooting and handling of ICT server system remote environment. **4.0. Essential skills:** 4.1. Problem solving skills;

	4.2. Critical thinking skills; 4.3. Analytical skills; 4.4. Communication skills; 4.5. Report writing skills; 4.6. Interpersonal skills; 4.7. Teamwork skills; 4.8. Leadership skills; 4.9. Project management skills; 4.10. Time management skills.
DESCRIPTION OF END PRODUCTS/SERVICE	The remote maintenance environment for the server system is built and provided as per industry standards and national ICT guidelines.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Configuration of the server remote maintenance environment; 2. Testing of the remote login environment; 3. Troubleshooting and handling of remote login environment faults.

OCCUPATION	IT TECHNOLOGIST	**OCCUPATION CODE**	
DUTY TITLE	MANAGE SMALL ICT PROJECT R&D PROCESS	**DUTY NO.**	706
TASK TITLE	REASONABLY ASSIGN ICT PROJECT TASKS	**TASK NO.**	7061
PERFORMANCE CRITERIA	The person performing this task must be able to reasonably assign project tasks as per industry standards and national ICT guidelines.		
RANGE STATEMENT:	This task can be completed in an office environment or at a client site. The following items and tools should be available: 1. Computer; 2. Business case documentation; 3. Feasibility study; 4. Demonstration tools. This person shall work independently.		

EVIDENCE REQUIREMENTS	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Determine the task of ICT project; 2. Master the rules of task assignment; 3. Prepare task assignment table for ICT projects; 4. Study information related to ICT project task assignment; 5. Observe health and safety precautions at work; 6. Clean workplace; 7. Store tools.	Detailed knowledge about: **1.0. Methods:** The person must be able to explain how to: 1.1.Determine task of the ICT project; 1.2.Assign tasks; 1.3.Prepare task assignment table; 1.4.Study project task assignment. **2.0. Principles:** The person must be able to explain the principles of: 2.1.Project task assignment principles; 2.2.Rules for preparing project task assignment table; **3.0. Theories:** The person must be able to explain: 3.1. Project schedule; 3.2 Team roles and responsibilities; 3.3 Project task planning; 3.4 Priorities and milestones; 3.5 Accountability and responsibility. **4.0. Essential skills:** 4.1.Problem solving skills 4.2. Critical thinking skills; 4.3. Analytical skills; 4.4. Communication skills; 4.5. Report writing skills; 4.6. Interpersonal skills; 4.7. Teamwork skills; 4.8. Leadership skills;

	4.9. Project management skills; 4.10. Time management skills.
DESCRIPTION OF END PRODUCTS/SERVICE	ICT project tasks are assigned as per industry standards and national ICT guidelines.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. ICT project task assignment rules; 2. ICT project task assignment.

OCCUPATION	IT TECHNOLOGIST	**OCCUPATION CODE**	
DUTY TITLE	MANAGE SMALL ICT PROJECT R&D PROCESS	**DUTY NO.**	706
TASK TITLE	EVALUATE THE WORKLOAD OF ICT PROJECTS	**TASK NO.**	7062
PERFORMANCE CRITERIA	The person performing this task must be able to evaluate the ICT project workload as per industry standards and national ICT guidelines.		
RANGE STATEMENT:	This task can be completed in an office environment or at a client site. The following items and tools should be available: 1. Computer; 2. Business case documentation; 3. Feasibility study; 4. Demonstration tools. This person shall work independently.		

EVIDENCE REQUIREMENTS	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Plan task schedule as per task cycle; 2. Prepare workload assessment documents for ICT projects; 3. Optimize the relationship between the workload, duration, and budget of the ICT project; 4. Study information related to workload schedule for ICT project; 5. Observe health and safety precautions at work; 6. Clean workplace; 7. Store tools.	Detailed knowledge about: **1.0. Methods:** The person must be able to explain how to: 1.1.Determine the ICT project task schedule; 1.2.Optimize the relationship between workload, duration, and budget of ICT project; 1.3.Prepare project workload assessment document; 1.4.Study project work plans. **2.0. Principles:** The person must be able to explain the principles of: 2.1.Project task planning cycle; 2.2.Project task workload assessment document; **3.0. Theories:** The person must be able to explain: 3.1.Project workload arrangement; 3.2.Project workload assessment methods and techniques; 3.3.Project work cycle; 3.4.Project workload, duration, and budget. **4.0. Essential skills:** 4.1. Problem solving skills; 4.2. Critical thinking skills;

	4.3. Analytical skills; 4.4. Communication skills; 4.5. Report writing skills; 4.6. Interpersonal skills; 4.7. Teamwork skills; 4.8. Leadership skills; 4.9. Project management skills; 4.10. Time management skills.
DESCRIPTION OF END PRODUCTS/SERVICE:	ICT project workload is assessed as per industry standards and national ICT guidelines.
CIRCUMSTANTIAL KNOWLEDGE:	**Detailed knowledge about:** 1. ICT project task cycle; 2. ICT project assessment document preparation rules.

OCCUPATION	IT TECHNOLOGIST	**OCCUPATION CODE**	
DUTY TITLE	MANAGE SMALL ICT PROJECT R&D PROCESS	**DUTY NO.**	706
TASK TITLE	DEVELOP ICT PROJECT IMPLEMENTATION PLANS	**TASK NO.**	7063
PERFORMANCE CRITERIA	The person performing this task must be able to develop an ICT project implementation plan as per industry standards and national ICT guidelines.		
RANGE STATEMENT	This task can be completed in an office environment or at a client site. The following items and tools should be available: 1. Computer; 2. Business case documentation; 3. Feasibility study; 4. Demonstration tools. This person shall work independently.		

EVIDENCE REQUIREMENTS	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Understand ICT project background and objectives; 2. Determine ICT project implementation strategy and process; 3. Prepare ICT project implementation plan/project proposal; 4. Study information about the ICT project implementation plan; 5. Observe health and safety precautions at work; 6. Clean workplace; 7. Store tools.	Detailed knowledge about: **1.0. Methods:** The person must be able to explain how to: 1.1.ICT project background and objectives; 1.2.ICT project implementation strategy and process; 1.3.Prepare ICT project implementation plan/project proposal; 1.4.Study the project implementation plan. **2.0. Principles:** The person must be able to explain the principles of: 2.1.Project implementation plan and strategy; 2.2.Project implementation plan/project proposal development. **3.0. Theories:** The person must be able to explain: 3.1. Project implementation objectives; 3.2 Project implementation plan; 3.3 Project implementation strategy and process. **4.0. Essential skills:** 4.1. Problem solving skills; 4.2. Critical thinking skills; 4.3. Analytical skills; 4.4. Communication skills; 4.5. Report writing skills;

	4.6. Interpersonal skills; 4.7. Teamwork skills; 4.8. Leadership skills; 4.9. Project management skills; 4.10. Time management skills.
DESCRIPTION OF END PRODUCTS/SERVICE	ICT project implementation plan is developed as per industry standards and national ICT guidelines.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. ICT project implementation plan objectives; 2. ICT project implementation plan.

OCCUPATION	IT TECHNOLOGIST	**OCCUPATION CODE**	
DUTY TITLE	MANAGE SMALL ICT PROJECT R&D PROCESS	**DUTY NO.**	706
TASK TITLE	MANAGE ICT PROJECT IMPLEMENTATION PROCESS	**TASK NO.**	7064
PERFORMANCE CRITERIA	The person performing this task must be able to manage the ICT project implementation process as per industry standards and national ICT guidelines.		
RANGE STATEMENT	This task can be completed in an office environment or at a client site. The following items and tools should be available: 1. Computer; 2. Business case documentation; 3. Feasibility study; 4. Demonstration tools. This person shall work independently.		

EVIDENCE REQUIREMENTS

PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Summarize the ICT project implementation process in phases; 2. Evaluate the results of each phase of ICT project implementation; 3. Prepare reports on the implementation process of each phase of the ICT project; 4. Study information related to the ICT project implementation process; 5. Observe health and safety precautions at work; 6. Clean workplace; 7. Store tools.	Detailed knowledge about: **1.0. Methods:** The person must be able to explain how to: 1.1. Summarize the ICT project implementation process in phases; 1.2. Evaluate the results of each phase of ICT project implementation; 1.3. Prepare reports on the implementation process of each phase of the ICT project; 1.4. Study information related to the ICT project implementation process. **2.0. Principles:** The person must be able to explain the principles of: 2.1. Project implementation process summary; 2.2 Project implementation results evaluation; 2.2 Rules for the preparation of the project implementation process results report. **3.0. Theories:** The person must be able to explain: 3.1. Project implementation process summary method; 3.2 Project implementation process results evaluation program. **4.0. Essential skills:**

	4.1.Problem solving skills 4.2. Critical thinking skills; 4.3. Analytical skills; 4.4. Communication skills; 4.5. Report writing skills; 4.6. Interpersonal skills; 4.7. Teamwork skills; 4.8. Leadership skills; 4.9. Project management skills; 4.10. Time management skills.
DESCRIPTION OF END PRODUCTS/SERVICE	ICT project implementation process is managed as per industry standards and national ICT guidelines.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Project phase implementation process; 2. Project phase implementation results evaluation; 3. Preparation of project phase implementation process report.

OCCUPATION	IT TECHNOLOGIST	**OCCUPATION CODE**	
DUTY TITLE	MANAGE SMALL ICT PROJECT R&D PROCESS	**DUTY NO.**	706
TASK TITLE	EVALUATE ICT PROJECT OBJECTIVES ACHIEVEMENT	**TASK NO.**	7065
PERFORMANCE CRITERIA	The person performing this task must be able to evaluate the achievement of ICT project objectives as per industry standards and national ICT guidelines.		
RANGE STATEMENT	This task can be completed in an office environment or at a client site. The following items and tools should be available: 1. Computer; 2. Business case documentation; 3. Feasibility study; 4. Demonstration tools. This person shall work independently.		

EVIDENCE REQUIREMENTS	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Compare the original objectives of the ICT project with the achieved objectives; 2. Analyze the degree of achievement of the ICT project objectives; 3. Develop evaluation forms and reports on the achievement of ICT project objectives; 4. Study information on the achievement of ICT project objectives; 5. Observe health and safety precautions at work; 6. Clean workplace; 7. Store tools.	Detailed knowledge about: **1.0. Methods:** The person must be able to explain how to: 1.1. Compare the original objectives of the ICT project with the achieved objectives; 1.2. Analyze the degree of achievement of the ICT project objectives; 1.3. Develop evaluation forms and reports on the achievement of ICT project objectives; 1.4. Study information on the achievement of project objectives. **2.0. Principles:** The person must be able to explain the principles of: 2.1. Evaluation of the degree of achievement of the project objectives; 2.2 Evaluation of the achievement of the project objectives. **3.0. Theories:** The person must be able to explain: 3.1. Method for calculating the degree of achievement of the project objectives; 3.2 Program for evaluating the achievement of project objectives. **4.0. Essential skills:**

	4.1. Problem solving skills; 4.2. Critical thinking skills; 4.3. Analytical skills; 4.4. Communication skills; 4.5. Report writing skills; 4.6. Interpersonal skills; 4.7. Teamwork skills; 4.8. Leadership skills; 4.9. Project management skills; 4.10. Time management skills.
DESCRIPTION OF END PRODUCTS/SERVICE	The achievement of ICT project objectives is evaluated as per industry standards and national ICT guidelines.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. The original and achieved objectives of the project; 2. Method for calculating the degree of achievement of the project objectives; 3. Evaluation forms and reports on the achievement of project objectives.

OCCUPATION	IT TECHNOLOGIST	**OCCUPATION CODE**	
DUTY TITLE	IMPLEMENT SMALL ICT PROJECT R&D	**DUTY NO.**	707
TASK TITLE	DEVELOP ICT PROJECT (PRODUCT) OUTLINE DESIGN	**TASK NO.**	7071
PERFORMANCE CRITERIA	The person performing this task must be able to develop outline designs for ICT projects (products) as per industry standards and national ICT governance guidelines		
RANGE STATEMENT	This task can be completed in an office environment or at a client site. The following items and tools should be available: 1. Computer; 2. Project manual; 3. Related reporting software tools; 4. Project (product) outline design report. This person can work independently or communicate and cooperate with colleagues to complete the work.		

EVIDENCE REQUIREMENTS

PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Develop the technical functions and framework for project implementation; 2. Develop design guidelines and common processing guidelines; 3. Develop functional and business processing of each functional module; 4. Develop the interface relationship between modules; 5. Observe health and safety precautions; 6. Clean workplace; 7. Store tools.	Detailed knowledge about: **1.0.Methods** The person must be able to explain how to: 1.1. Develop the technical functions and framework for project implementation; 1.2. Develop design guidelines and common processing guidelines; 1.3. Develop functional and business processing of each functional module; 1.4. Develop the interface relationship between modules. **2.0.Principles** The person must be able to explain the principles of: 2.1.Project outline design; 2.2.Software specifications. **3.0.Theories:** The person must be able to explain: 3.1. Project definition; 3.2. Process design; 3.3. Project architecture. **4.0. Essential skills:** 4.1.Problem solving skills; 4.2.Critical thinking skills;

	4.3.Analytical skills; 4.4.Communication skills; 4.5.Report writing skills; 4.6.Interpersonal skills; 4.7.Teamwork skills; 4.8.Leadership skills; 4.9.Project management skills; 4.10. Time management skills.
DESCRIPTION OF END PRODUCTS/SERVICE	The outline design of ICT projects (products) is developed as per industry standards and national ICT governance guidelines.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Project process definition and design; 2. Project information analysis and processing; 3. Project architecture design.

OCCUPATION	IT TECHNOLOGIST	**OCCUPATION CODE**	
DUTY TITLE	IMPLEMENT SMALL ICT PROJECT R&D	**DUTY NO.**	707
TASK TITLE	DEVELOP ICT PROJECT (PRODUCT) DETAILED DESIGN	**TASK NO.**	7072
PERFORMANCE CRITERIA	The person performing this task must be able to develop detailed designs for ICT projects (products) as per industry standards and national ICT governance guidelines.		
RANGE STATEMENT	This task can be completed in an office environment or at a client site. The following items and tools should be available: 1. Computer; 2. Project manual; 3. Related reporting software tools; 4. Project (product) detailed design report. This person can work independently or communicate and cooperate with colleagues to complete the work.		

EVIDENCE REQUIREMENTS	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Develop the detailed implementation of the functional units of each functional module; 2. Determine the algorithms used for each module; 3. Determine the data structure used by each module; 4. Determine the details of the module interfaces; 5. Design the test cases for each module; 6. Observe health and safety precautions; 7. Clean workplace; 8. Store tools.	Detailed knowledge about: **1.0.Methods** The person must be able to explain how to: 1.1. Determine the algorithms used for each module; 1.2. Determine the data structure used by each module; 1.3. Determine the details of the module interfaces; 1.4. Design the test cases for each module. **2.0.Principles** The person must be able to explain the principles of: 2.1.Logical description of the module; 2.2.Structured design method; 2.3.Appropriate description tools. **3.0.Theories:** The person must be able to explain: 3.1.Demand analysis; 3.2.Specification; 3.3.Tools; 3.4.Documentation. **4.0. Essential skills:** 4.1.Problem solving skills; 4.2.Critical thinking skills;

	4.3.Analytical skills; 4.4.Communication skills; 4.5.Report writing skills; 4.6.Interpersonal skills; 4.7.Teamwork skills; 4.8.Leadership skills; 4.9.Project management skills; 4.10. Time management skills.
DESCRIPTION OF END PRODUCTS/SERVICE	The detailed design of ICT projects (products) is developed as per industry standards and national ICT governance guidelines.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Processing of demand analysis; 2. Organization of specification; 3. Documentation methods.

OCCUPATION	IT TECHNOLOGIST	**OCCUPATION CODE**	
DUTY TITLE	IMPLEMENT SMALL ICT PROJECT R&D	**DUTY NO.**	707
TASK TITLE	COMPLETE CODING FOR ONE ASPECT OF THE ICT PROJECT (PRODUCT)	**TASK NO.**	7073
PERFORMANCE CRITERIA	The person performing this task must be able to complete coding for one aspect of the ICT project (product) as per industry standards and national ICT governance guidelines.		
RANGE STATEMENT	This task can be performed in a workshop or in a client's office. The following materials and tools should be available: 1. Coding guidelines; 2. Coding standards; 3. Project requirements; 4. User requirements; 5. Computer; 6. Relevant software tools. This person can work independently or communicate and cooperate with colleagues to complete the work.		

EVIDENCE REQUIREMENTS	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Interpret the development process of small ICT projects; 2. Explain business requirements; 3. Write code for one aspect of an ICT project (product); 4. Observe health and safety precautions; 5. Clean workplace; 6. Store tools.	Detailed knowledge about: **1.0.Methods** The person must be able to explain how to: 1.1.Interpret project requirements into codes; 1.2.Translate user requirements into codes; 1.3.Write codes. **2.0.Principles** The person must be able to explain the principles of: 2.1.Writing codes; 2.2.Translating user requirements into codes. **3.0.Theories:** The person must be able to explain: 3.1.Coding specification; 3.2.Types of user requirements. **4.0. Essential skills:** 4.1.Problem solving skills; 4.2.Critical thinking skills; 4.3.Analytical skills; 4.4.Communication skills; 4.5.Report writing skills; 4.6.Interpersonal skills;

	4.7.Teamwork skills; 4.8.Leadership skills; 4.9.Project management skills; 4.10. Time management skills.
DESCRIPTION OF END PRODUCTS/SERVICE	Coding for one aspect of an ICT project (product) is completed as per industry standards and national ICT governance guidelines.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Project process definition; 2. User requirements; 3. Computer hardware and software; 4. Normalization of coding.

OCCUPATION	IT TECHNOLOGIST	**OCCUPATION CODE**	
DUTY TITLE	IMPLEMENT SMALL ICT PROJECT R&D	**DUTY NO.**	707
TASK TITLE	COMPLETE ICT PROJECT (PRODUCT) INTEGRATION TESTING	**TASK NO.**	7074
PERFORMANCE CRITERIA	The person performing this task must be able to complete ICT project (product) integration testing as per industry standards and national ICT governance guidelines.		
RANGE STATEMENT	This task can be performed in a workshop or in a client's office. The following materials and tools should be available: 1. Project integration testing guide; 2. Project integration testing standards; 3. Business case; 4. Project requirements specification; 5. Computer; 6. Relevant software tools; 7. IT technologist toolkit. This person can work independently or communicate and cooperate with colleagues to complete the work.		

EVIDENCE REQUIREMENTS	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Create an integration testing program; 2. Run integration testing routines; 3. Observe integration testing routines; 4. Create integration testing reports; 5. Observe health and safety precautions; 6. Clean workplace; 7. Store tools.	Detailed knowledge about: **1.0.Methods** The person must be able to explain how to: 1.1. Read and interpret integration testing programs; 1.2. Use various integration testing tools; 1.3. Draft project integration testing programs; 1.4. Explain integration testing routines; 1.5. Show the testing reports. **2.0.Principles** The person must be able to explain the principles of: 2.1.Principles of project integration testing. **3.0.Theories:** The person must be able to explain: 3.1.Project integration testing techniques; 3.2.Project integration testing tools; 3.3.Project integration testing methods. **4.0. Essential skills:** 4.1.Problem solving skills; 4.2.Critical thinking skills;

	4.3.Analytical skills; 4.4.Communication skills; 4.5.Report writing skills; 4.6.Interpersonal skills; 4.7.Teamwork skills; 4.8.Leadership skills; 4.9.Project management skills; 4.10.Time management skills.
DESCRIPTION OF END PRODUCTS/SERVICE	ICT project (product) integration testing is completed as per industry standards and national ICT governance guidelines
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Project integration testing engineering; 2. Project integration testing procedures; 3. Project integration testing methods.

OCCUPATION	IT TECHNOLOGIST	**OCCUPATION CODE**	
DUTY TITLE	MANAGE ENTERPRISE ICT PROJECT ENGINEERING IMPLEMENTATION PROCESS	**DUTY NO.**	708
TASK TITLE	SUPERVISE THE IMPLEMENTATION OF ICT PROJECTS AS PER INDUSTRY STANDARDS AND SPECIFICATIONS	**TASK NO.**	7081
PERFORMANCE CRITERIA	The person performing this task must be able to supervise the ICT project implementation as per industry standards and specifications.		
RANGE STATEMENT	This task can be performed in an office or at a client's site. The following equipment and tools should be available: 1. Computer; 2. Relevant software tools; 3. Design drawings and related standards and specifications.		

EVIDENCE REQUIREMENTS	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Be familiar with the ICT project construction process and technology, ICT project management process and ICT project acceptance specification; 2. Independently supervise and manage on-site construction quality and schedule; 3. Prepare ICT project supervision reports.	Detailed knowledge about: **1.0. Methods:** The person must be able to explain how to: 1.1. Supervise the construction quality and schedule of ICT projects during the construction process; 1.2. Coordinate the overall schedule of construction contractors and designers; 1.3. Coordinate to solve technical problems of on-site construction; 1.4. Summarize and analyze the construction schedule and quality; 1.5. Prepare supervision report and provide feedback on it to the Chief Engineer. **2.0. Principles:** The person must be able to explain the principles of: 2.1.Code of practice and conduct for Engineers; 2.2. PMP project management knowledge system. **3.0. Theories:** The person must be able to explain: 3.1. ICT project construction process and technology; 3.2.Project management process;

	3.3.Project acceptance specifications. **4.0. Essential skills:** 4.1. Problem solving skills; 4.2. Skills to adapt to changes; 4.3. Analytical skills; 4.4. Communication skills; 4.5. Report writing skills; 4.6. Interpersonal skills; 4.7. Teamwork skills; 4.8. Leadership skills; 4.9. PMP project management skills. 4.10. Time management skills.
DESCRIPTION OF END PRODUCTS/SERVICE	Monitoring and inspection are conducted as per project quality and schedule requirements, and project supervision reports are prepared as per ICT project industry standards and specifications.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Project management process; 2. ICT project industry standards and specifications; 3. Code of practice and conduct for Engineers.

OCCUPATION	IT TECHNOLOGIST	**OCCUPATION CODE**	
DUTY TITLE	MANAGE ENTERPRISE ICT PROJECT ENGINEERING IMPLEMENTATION PROCESS	**DUTY NO.**	708
TASK TITLE	EVALUATE ICT ENGINEERING BUDGETS AND CONTROL ENTERPRISE ICT PROJECT COSTS	**TASK NO.**	7082
PERFORMANCE CRITERIA	The person performing this task must be able to evaluate the ICT project budget and control costs as per the project budget estimate quota.		
RANGE STATEMENT	This task can be performed in an office or at a client's site. The following equipment and tools should be available: 1. Computer; 2. Relevant software tools; 3. Information on the construction process and the budget estimate quotas.		

EVIDENCE REQUIREMENTS

PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Skills to read and understand drawings for ICT projects; 2. Be familiar with ICT project budget estimate quota and be able to use budget estimate software; 3. Review the construction contractor's pre-settlement and material plan; 4. Follow up and monitor the cost control in each project contract.	Detailed knowledge about: **1.0. Methods:** The person must be able to explain how to: 1.1. Identify drawings during the construction of ICT projects; 1.2. Evaluate the rationality of ICT project budget; 1.3. Review the monthly completed quantities statement submitted by the construction contractor. **2.0. Principles:** The person must be able to explain the principles of: 2.1. Budgeting method; 2.2. PMP project management knowledge system. **3.0. Theories:** The person must be able to explain: 3.1. Budget estimate quotas for ICT projects; 3.2. Quantity and material plan for project construction. **4.0. Essential skills:** 4.1. Problem solving skills; 4.2. Skills to adapt to changes; 4.3. Analytical skills; 4.4. Communication skills; 4.5. Report writing skills; 4.6. Interpersonal skills; 4.7. Teamwork skills;

	4.8. Leadership skills; 4.9. PMP project management skills; 4.10. Time management skills.
DESCRIPTION OF END PRODUCTS/SERVICE	The rationality of ICT project budget is evaluated to control the affordable expenditure of the enterprise ICT project.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Project management process; 2. ICT project budget estimate quotas; 3. Budget estimate preparation methods; 4. Identifying and drawing construction drawings for ICT projects.

OCCUPATION	IT TECHNOLOGIST	**OCCUPATION CODE**	
DUTY TITLE	MANAGE ENTERPRISE ICT PROJECT ENGINEERING IMPLEMENTATION PROCESS	**DUTY NO.**	708
TASK TITLE	CONTROL ICT PROJECT SCHEDULE AND QUALITY	**TASK NO.**	7083
PERFORMANCE CRITERIA	The person performing this task must be able to develop a project plan and control the schedule and quality of the ICT project.		
RANGE STATEMENT	This task can be performed in an office or at a client's site. The following equipment and tools should be available: 1. Computer; 2. Relevant software tools; 3. Project implementation tools.		

EVIDENCE REQUIREMENTS	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Be familiar with the on-site construction process and methods of ICT project; 2. Ensure smooth and stable construction schedule, quality, safety, cost and data of the project.	Detailed knowledge about: **1.0. Methods:** The person must be able to explain how to: 1.1. Develop construction flow chart for projects; 1.2. Drive the project in terms of schedule, quality, and customer needs based on compliance with the process; 1.3. Complete ICT projects and deliver them to the client. **2.0. Principles:** The person must be able to explain the principles of: 2.1. PMP project management knowledge system. **3.0. Theories:** The person must be able to explain: 3.1. ICT project program knowledge and industry regulations; 3.2. On-site construction process and methods of ICT project. **4.0. Essential skills:** 4.1. Problem solving skills; 4.2. Skills to adapt to changes; 4.3. Analytical skills; 4.4. Communication skills; 4.5. Report writing skills; 4.6. Interpersonal skills; 4.7. Teamwork skills;

	4.8. Leadership skills; 4.9. PMP project management skills; 4.10. Time management skills.
DESCRIPTION OF END PRODUCTS/SERVICE	The schedule and quality of ICT projects are controlled as per the client's requirements.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Identify and draw construction drawings for ICT projects; 2. Construction flowcharts and process requirements for engineering projects.

OCCUPATION	IT TECHNOLOGIST	**OCCUPATION CODE**	
DUTY TITLE	MANAGE ENTERPRISE ICT PROJECT ENGINEERING IMPLEMENTATION PROCESS	**DUTY NO.**	708
TASK TITLE	DESIGN AND IMPLEMENT INDOOR DISTRIBUTED SYSTEM SOLUTIONS	**TASK NO.**	7084
PERFORMANCE CRITERIA	The person performing this task must be able to design and engineer the implementation of indoor distributed solutions for ICT projects.		
RANGE STATEMENT	This task can be performed in an office or at a client's site. The following equipment and tools should be available: 1. Computer; 2. Relevant software tools; 3. Project implementation tools.		

EVIDENCE REQUIREMENTS	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Be familiar with indoor distributed system solution design methods; 2. Ensure the construction schedule, quality, safety, cost and information of the project comply with the industry regulations and the related work is carried out smoothly.	Detailed knowledge about: **1.0. Methods:** The person must be able to explain how to: 1.1. Apply program knowledge to design an indoor distributed system scheme; 1.2. Develop construction flowcharts for indoor distributed system projects; 1.3. Drive the project in terms of schedule, quality, and customer needs based on compliance with the process. **2.0. Principles:** The person must be able to explain the principles of: 2.1. PMP project management knowledge system; 2.2. Survey process and design specifications for indoor distributed systems. **3.0. Theories:** The person must be able to explain: 3.1. Program knowledge and industry regulations for ICT indoor distributed project; 3.2. Construction process and method at the ICT project site. **4.0. Essential skills:** 4.1. Problem solving skills; 4.2. Skills to adapt to changes; 4.3. Analytical skills;

	4.4. Communication skills; 4.5. Report writing skills; 4.6. Interpersonal skills; 4.7. Teamwork skills; 4.8. Leadership skills; 4.9. PMP project management skills; 4.10. Time management skills; 4.11. Survey and design skills.
DESCRIPTION OF END PRODUCTS/SERVICE	ICT indoor distributed systems are designed and project schedules and quality are controlled based on program knowledge and industry specifications.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Identify and draw construction drawings for ICT indoor distributed system projects; 2. Survey process and design specifications for ICT indoor distributed system; 3. Construction flow chart and process requirements for ICT indoor distributed system projects.

<table>
<tr><td>OCCUPATION</td><td>IT TECHNOLOGIST</td><td>OCCUPATION CODE</td><td></td></tr>
<tr><td>DUTY TITLE</td><td>MANAGE ENTERPRISE ICT PROJECT ENGINEERING IMPLEMENTATION PROCESS</td><td>DUTY NO.</td><td>708</td></tr>
<tr><td>TASK TITLE</td><td>MANAGE ENTERPRISE ICT PROJECT DOCUMENTS</td><td>TASK NO.</td><td>7085</td></tr>
<tr><td>PERFORMANCE CRITERIA</td><td colspan="3">The person performing this task must be able to manage and store documents throughout the project process for enterprise ICT engineering projects.</td></tr>
<tr><td>RANGE STATEMENT</td><td colspan="3">This task can be performed in an office or at a client’s site.
The following equipment and tools should be available:
1. Computer;
2. Relevant software tools;
3. Document storage tools.</td></tr>
<tr><td colspan="4">EVIDENCE REQUIREMENTS</td></tr>
<tr><td colspan="2">PRACTICAL PERFORMANCE</td><td colspan="2">UNDERPINNING KNOWLEDGE</td></tr>
<tr><td colspan="2">The person performing this task must be able to do the following:

1. Be familiar with ICT project program knowledge and industry regulations;
2. Be familiar with ICT project process;
3. Manage enterprise ICT project documents as per quality system requirements.</td><td colspan="2">Detailed knowledge about:
1.0. Methods:
The person must be able to explain how to:
1.1. Manage ICT engineering project documents;
1.2. Supervise and provide feedback on the implementation of ICT engineering projects;
1.3. Participate in the construction of enterprise quality system.

2.0. Principles:
The person must be able to explain the principles of:
2.1. PMP project management knowledge system;
2.2.Five tools and seven principles of quality management.

3.0. Theories:
The person must be able to explain:
3.1. ICT project program knowledge and industry regulations;
3.2. GMP or ISO quality management system.

4.0. Essential skills:
4.1. Problem solving skills;
4.2. Skills to adapt to changes;
4.3. Analytical skills;
4.4. Communication skills;
4.5. Report writing skills;</td></tr>
</table>

	4.6. Interpersonal skills; 4.7. Teamwork skills; 4.8. Leadership skills; 4.9. PMP project management skills; 4.10. Time management skills.
DESCRIPTION OF END PRODUCTS/SERVICE	Documents are managed and stored throughout the project process of an enterprise ICT project, as per the quality system requirements.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Five tools and seven principles of quality management; 2. Project management process; 3. ICT project industry standards and specifications.

OCCUPATION	IT TECHNOLOGIST	**OCCUPATION CODE**	
DUTY TITLE	DEVELOP AND IMPROVE ENTERPRISE ICT PRODUCTS	**DUTY NO.**	709
TASK TITLE	TAP INTO AND ANALYZE THE ICT SERVICE NEEDS OF ENTERPRISES	**TASK NO.**	7091
PERFORMANCE CRITERIA	The person performing this task must be able to tap and analyze the ICT service needs of the enterprise as per industry standards and national ICT guidelines.		
RANGE STATEMENT	This task can be completed in an office environment or at a client site. The following items and tools should be available: 1. Computer; 2. Business manual; 3. Business process modeling tools; 4. Demonstration tools. This person shall communicate and cooperate with corporate staff and work independently in a team to complete the work they are responsible for.		

EVIDENCE REQUIREMENTS

PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Assess business processes; 2. Identify ICT service needs; 3. Conduct a feasibility study on ICT service needs; 4. Observe health and safety precautions at work; 5. Clean workplace; 6. Store tools.	Detailed knowledge about: **1.0. Methods:** The person must be able to explain how to: 1.1. Assess business processes; 1.2. Identify ICT service needs; 1.3. Conduct a feasibility study on ICT service needs. **2.0. Principles:** The person must be able to explain the principles of: 2.1. Demand analysis; 2.2. Feasibility analysis. **3.0. Theories:** The person must be able to explain: 3.1. Stakeholder analysis; 3.2. Cost-benefit analysis; 3.3. SWOT analysis; 3.4. System analysis. **4.0. Essential skills:** 4.1. Problem solving skills; 4.2. Critical thinking skills; 4.3. Analytical skills;

	4.4. Communication skills; 4.5. Report writing skills; 4.6. Interpersonal skills; 4.7. Teamwork skills; 4.8. Leadership skills; 4.9. Project management skills; 4.10. Time management skills.
DESCRIPTION OF END PRODUCTS/SERVICE	Enterprise ICT service needs are tapped and analyzed as per industry standards and national ICT guidelines
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Business process; 2. Next generation of ICT technology; 3. Job responsibilities.

OCCUPATION	IT TECHNOLOGIST	**OCCUPATION CODE**	
DUTY TITLE	DEVELOP AND IMPROVE ENTERPRISE ICT PRODUCTS	**DUTY NO.**	709
TASK TITLE	TRACK AND CLARIFY ICT SERVICE NEEDS OF ENTERPRISES	**TASK NO.**	7092
PERFORMANCE CRITERIA	The person performing this task must be able to track and clarify the ICT service needs of the enterprise as per industry standards and national ICT procurement guidelines.		
RANGE STATEMENT:	This task can be performed in a client's office. The following materials and tools should be available: 1. Needs summary list; 2. Needs summary criteria; 3. Business cases; 4. Computer; 5. IT technologist toolkit; 6. Relevant software tools. This person shall communicate and cooperate with corporate staff and work independently in a team to complete the work they are responsible for.		

EVIDENCE REQUIREMENTS	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Track ICT service needs; 2. Assess ICT service needs feasibility; 3. Prepare a list of ICT service needs; 4. Observe health and safety precautions; 5. Clean workplace; 6. Store tools.	Detailed knowledge about: **1.0. Methods:** The person must be able to explain how to: 1.1. Track ICT service needs; 1.2. Assess ICT service needs feasibility; 1.3. Prepare a list of ICT service needs. **2.0. Principles:** The person must be able to explain the principles of: 2.1. Tracking needs; 2.2. Assessing the feasibility of needs; 2.3. Developing a list of needs. **3.0. Theories:** The person must be able to explain: 3.1.Types of ICT services; 3.2.Types of business information systems; 3.3.Feasibility assessment criteria. **4.0. Essential skills:** 4.1. Problem solving skills; 4.2. Critical thinking skills;

	4.3. Analytical skills; 4.4. Communication skills; 4.5. Report writing skills; 4.6. Interpersonal skills; 4.7. Teamwork skills; 4.8. Leadership skills; 4.9. Project management skills; 4.10. Time management skills.
DESCRIPTION OF END PRODUCTS/SERVICE	Enterprise ICT service needs are tracked and clarified as per industry standards and national ICT procurement guidelines.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Tracking needs; 2. Business information system; 3. Next generation of ICT technology; 4. Job responsibilities.

OCCUPATION	IT TECHNOLOGIST	**OCCUPATION CODE**	
DUTY TITLE	DEVELOP AND IMPROVE ENTERPRISE ICT PRODUCTS	**DUTY NO.**	709
TASK TITLE	DESIGN AND PREPARE ENTERPRISE ICT SERVICE TECHNICAL SPECIFICATIONS	**TASK NO.**	7093
PERFORMANCE CRITERIA	The person performing this task must be able to design and prepare technical specifications for enterprise ICT services as per industry standards and national ICT guidelines.		
RANGE STATEMENT	This task can be performed in a workshop or in a client's office. The following materials and tools should be available: 1. Technical specification standards; 2. Business requirements; 3. User requirements; 4. List of required ICT technology systems and services; 5. Computer; 6. Relevant software tools. This person shall communicate and cooperate with corporate staff and work independently in a team to complete the work they are responsible for.		

EVIDENCE REQUIREMENTS	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Interpret ICT service needs; 2. Prepare an outline description of ICT technical service specifications; 3. Interpret ICT service specifications; 4. Observe health and safety precautions; 5. Clean workplace; 6. Store tools.	Detailed knowledge about: **1.0. Methods:** The person must be able to explain how to: 1.1. Interpret ICT service needs; 1.2. Prepare an outline description of ICT technical service specifications; 1.3. Interpret ICT service specifications. **2.0. Principles:** The person must be able to explain the principles of: 2.1. Preparation of technical specifications; 2.2. Translating enterprise ICT service needs into technical specifications. **3.0. Theories:** The person must be able to explain: 3.1. Types of ICT service needs; 3.2. Types of ICT technical specifications. **4.0. Essential skills:** 4.1. Problem solving skills;

	4.2. Critical thinking skills; 4.3. Analytical skills; 4.4. Communication skills; 4.5. Report writing skills; 4.6. Interpersonal skills; 4.7. Teamwork skills; 4.8. Leadership skills; 4.9. Project management skills. 4.10. Time management skills.
DESCRIPTION OF END PRODUCTS/SERVICE	Technical specifications for the required ICT services are prepared as per industry standards and national ICT guidelines.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Business process; 2. Next generation of ICT technology; 3. Job responsibilities.

OCCUPATION	IT TECHNOLOGIST	**OCCUPATION CODE**	
DUTY TITLE	DEVELOP AND IMPROVE ENTERPRISE ICT PRODUCTS	**DUTY NO.**	709
TASK TITLE	ASSESS AND DETERMINE ICT SERVICE NEEDS ACHIEVEMENT	**TASK NO.**	7094
PERFORMANCE CRITERIA	The person performing this task must be able to assess and determine ICT service needs achievement as per industry standards and national ICT guidelines.		
RANGE STATEMENT	This task can be completed in an office environment or at a client site. The following items and tools should be available: 1. Computer; 2. List of ICT services; 3. ICT service implementation table; 4. Demonstration tools. This person shall communicate and cooperate with corporate staff and work independently in a team to complete the work they are responsible for.		

EVIDENCE REQUIREMENTS	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Interpret ICT service needs; 2. Analyze the implementation of ICT service needs; 3. Assesses the results of the implementation; 4. Observe health and safety precautions at work; 5. Clean workplace; 6. Store tools.	Detailed knowledge about: **1.0. Methods:** The person must be able to explain how to: 1.1. Interpret ICT service needs; 1.2. Analyze the implementation of ICT service needs; 1.3.Assesses the results of the implementation. **2.0. Principles:** The person must be able to explain the principles of: 2.1. Collection of ICT service implementation plans; 2.2. Assessing ICT service implementation results. **3.0. Theories:** The person must be able to explain: 3.1. Types of ICT services; 3.2. Criteria for assessing ICT service implementation. **4.0. Essential skills:** 4.1. Problem solving skills; 4.2. Critical thinking skills; 4.3. Analytical skills;

	4.4. Communication skills; 4.5. Report writing skills; 4.6. Interpersonal skills; 4.7. Teamwork skills; 4.8. Leadership skills; 4.9. Project management skills; 4.10. Time management skills.
DESCRIPTION OF END PRODUCTS/SERVICE	ICT service needs are assessed and determined as per industry standards and national ICT guidelines.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. ICT service implementation plan; 2. Assessment criteria; 3. Job responsibilities.

OCCUPATION	IT TECHNOLOGIST	**OCCUPATION CODE**	
DUTY TITLE	MANAGE ENTERPRISE ICT PRODUCT OR SERVICE PROVIDERS	**DUTY NO.**	710
TASK TITLE	DEVELOP ENTERPRISE ICT PRODUCT TECHNICAL PARAMETERS AND SERVICE AGREEMENTS	**TASK NO.**	7101
PERFORMANCE CRITERIA	The person performing this task must be able to develop enterprise ICT product technical parameters and service agreements as per industry standards and national ICT guidelines.		
RANGE STATEMENT	This task can be performed in a workshop or in a client's office. The following equipment and tools should be available: 1. Needs collection guide; 2. Needs collection criteria; 3. Computer; 4. Relevant software tools. This person can work independently or collaborate with others to complete the work.		

EVIDENCE REQUIREMENTS	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Identify enterprise ICT products or service providers; 2. Collect product performance requirements; 3. Analyze product performance requirements; 4. Develop enterprise ICT product technical parameters; 5. Determine service level objectives; 6. Determine evaluation indicators; 7. Develop enterprise ICT service agreements.	Detailed knowledge about: **1.0. Methods:** The person must be able to explain how to: 1.1. Collect product performance requirements; 1.2. Analyze product performance requirements; 1.3. Translate product performance requirements into enterprise ICT product technical parameters; 1.4. Set the scope of service agreements; 1.5. Set response and resolution times. **2.0. Principles:** The person must be able to explain the principles of: 2.1. Requirements for collection of product performance requirements; 2.2. Requirements for analysis of product performance requirements; 2.3. Preparation of service agreements; 2.4. Monitoring and evaluation of enterprise ICT products or services. **3.0. Theories:** The person must be able to explain:

	3.1. Product performance requirements; 3.2. Product technical parameters; 3.3. Types of services and performance measurement; 3.4. Types of service elements; 3.5. Types of service agreements and their criteria. **4.0. Essential skills:** 4.1. Problem solving skills; 4.2. Critical thinking skills; 4.3. Analytical skills; 4.4. Communication skills; 4.5. Report writing skills; 4.6. Interpersonal skills; 4.7. Teamwork skills; 4.8. Leadership skills; 4.9. Project management skills; 4.10. Time management skills.
DESCRIPTION OF END PRODUCTS/SERVICE	ICT products include semiconductors and their production devices, electronic communication devices, scientific instruments, computers and software and other devices. ICT services are the organic combination of telecommunication services, information services, IT services and applications.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Methods for analyzing product performance requirements; 2. Methods for developing product technical parameters; 3. Determining the requirements for service evaluation indicators; 4. Techniques for writing service agreements.

OCCUPATION	IT TECHNOLOGIST	**OCCUPATION CODE**	
DUTY TITLE	MANAGE ENTERPRISE ICT PRODUCT OR SERVICE PROVIDERS	**DUTY NO.**	710
TASK TITLE	MAINTAIN RELATIONSHIPS WITH ENTERPRISE ICT PRODUCT OR SERVICE PROVIDERS AND BUILD SUPPLIER RESOURCES	**TASK NO.**	7102
PERFORMANCE CRITERIA	The person performing this task must be able to maintain relationships with suppliers of enterprise ICT products or services and build supplier resources as per industry standards and national ICT guidelines.		
RANGE STATEMENT	This task can be performed in a workshop or in a client's office. The following equipment and tools should be available: 1. Computer; 2. Relevant software tools. This person can work independently or collaborate with others to complete the work.		

EVIDENCE REQUIREMENTS

PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Analyze product performance; 2. Identify product faults; 3. Interpret service agreements; 4. Liaise with enterprise ICT product or service providers; 5. Monitor the operation of ICT products; 6. Record the operational status of ICT products; 7. Monitor the implementation of service agreements; 8. Document the implementation status of service agreements; 9. Prepare interim implementation reports.	Detailed knowledge about: **1.0. Methods:** The person must be able to explain how to: 1.1. Analyze product performance; 1.2. Identify product faults; 1.3. Interpret service agreements; 1.4. Liaise with enterprise ICT product or service providers; 1.5. Monitor the operation of ICT products; 1.6. Record the operational status of ICT products; 1.7. Monitor the implementation of service agreements; 1.8. Document the implementation status of service agreements; 1.9. Prepare interim implementation reports. **2.0. Principles:** The person must be able to explain the principles of: 2.1. Maintaining enterprise ICT products; 2.2. Maintaining enterprise ICT service agreements; 2.3. Maintaining enterprise ICT product or service provider relationships.

	3.0. Theories: The person must be able to explain: 3.1. Product performance analysis; 3.2. Product fault identification; 3.3. Service types and performance measurement; 3.4. Types of service elements; 3.5. Types of service agreements and criteria. **4.0. Essential skills:** 4.1. Problem solving skills; 4.2. Critical thinking skills; 4.3. Analytical skills; 4.4. Communication skills; 4.5. Report writing skills; 4.6. Interpersonal skills; 4.7. Teamwork skills; 4.8. Leadership skills; 4.9. Project management skills; 4.10. Time management skills.
DESCRIPTION OF END PRODUCTS/SERVICE	ICT products include semiconductors and their production devices, electronic communication devices, scientific instruments, computers and software and other devices. ICT services are the organic combination of telecommunication services, information services, IT services and applications.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Methods of analyzing product performance; 2. Means to identify product faults; 3. Means to monitor the operation of ICT products; 4. Means to monitor the implementation of service agreements; 5. Techniques for preparing interim implementation reports.

OCCUPATION	IT TECHNOLOGIST	**OCCUPATION CODE**	
DUTY TITLE	MANAGE ENTERPRISE ICT PRODUCT OR SERVICE PROVIDERS	**DUTY NO.**	710
TASK TITLE	TRACK THE PRODUCT OR SERVICE DELIVERY PROCESS AND CONTROL DELIVERY RISKS	**TASK NO.**	7103
PERFORMANCE CRITERIA	The person performing this task must be able to track the product or service delivery process and control delivery risks as per industry standards and national ICT guidelines.		
RANGE STATEMENT	This task can be performed in a workshop or in a client's office. The following equipment and tools should be available: 1. Computer; 2. Relevant software tools. This person can work independently or collaborate with others to complete the work.		

EVIDENCE REQUIREMENTS

PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Analyze product performance; 2. Identify product faults; 3. Interpret service agreements; 4. Track the delivery of an enterprise ICT product or service; 5. Analyze the product or service delivery process; 6. Monitor and evaluate ICT products or services; 7. Supervise and urge suppliers for timely provision, maintenance or replacement of products or services.	Detailed knowledge about: **1.0. Methods:** The person must be able to explain how to: 1.1. Analyze product performance; 1.2. Identify product faults; 1.3. Interpret service agreements; 1.4. Measure service elements; 1.5. Track the delivery of an enterprise ICT product or service; 1.6. Analyze the product or service delivery process; 1.7. Monitor and evaluate ICT products or services; 1.8. Supervise and urge suppliers for timely provision, maintenance or replacement of products or services. **2.0. Principles:** The person must be able to explain the principles of: 2.1. Tracking the delivery of enterprise ICT products or services; 2.2. Monitoring and evaluating ICT products or services. **3.0. Theories:** The person must be able to explain:

	3.1. Product performance analysis; 3.2. Product fault identification; 3.3. Service types and performance measurement; 3.4. Types of service elements; 3.5. Types of service agreements and criteria. **4.0. Essential skills:** 4.1. Problem solving skills; 4.2. Critical thinking skills; 4.3. Analytical skills; 4.4. Communication skills; 4.5. Report writing skills; 4.6. Interpersonal skills; 4.7. Teamwork skills; 4.8. Leadership skills; 4.9. Project management skills; 4.10. Time management skills.
DESCRIPTION OF END PRODUCTS/SERVICE	ICT products include semiconductors and their production devices, electronic communication devices, scientific instruments, computers and software and other devices. ICT services are the organic combination of telecommunication services, information services, IT services and applications.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Methods of analyzing product performance; 2. Means to identify product faults; 3. Techniques for interpreting service agreements; 4. Methods of analyzing the product or service delivery process; 5. Ways and means of evaluating product or service quality.

TABLE 1: DACUM CHARTS FOR IT TECHNOLOGIST - NTA 7

DUTIES	TASKS	ENABLERS
1.0. Use ICT governance tools	1.1. Select ICT governance tools based on enterprise needs. 1.2. Maintain ICT governance tools. 1.3. Build an automated governance system. 1.4. Use governance tools to manage enterprise ICT systems, devices, and products.	**Generic Skills and Knowledge** • Basic skills on Operating Systems • Communication and report writing skills • Analytical and problem-solving skills • Solution development skills • Understand complex systems and how they work together • Eager to learn and master changing technology trends • Complex understanding of business requirements, processes and structures • Outstanding interpersonal skills **Tools and Equipment** • Relevant governance tools • Antistatic wrist strap • Safety gears • Computer **Materials** • Governance manual • Governance tool user manual • Equipment operating instructions or manuals **Work Behaviors** • Meticulous attention to detail • A logical approach to work • Patience

DUTIES	TASKS	ENABLERS
2.0. Build small network systems	2.1. Configure the device network address as per the network topology. 2.2. Configure routing protocols and complete interconnection as per the network topology. 2.3. Basic security configuration of network devices. 2.4. Diagnose and resolve simple network faults and maintain normal operation of network services. 2.5. Prepare and manage network system maintenance reports.	**Generic Skills and Knowledge** • Basic skills in Operating Systems • Skills in computer networks • Skills to write documents or reports • Basic skills in Cyber Security • Basic skills in scripting languages • Communication and report writing skills • Analytical skills • Analytical and problem-solving skills • Ethical skills **Tools and Equipment** • Antistatic wrist strap • Computer • Network packet capture and analysis tools • Network devices (switches, routers) **Materials** • Network planning manual • Network cables **Work Behaviors** • Meticulous attention to detail • A logical approach to work

DUTIES	TASKS	ENABLERS
3.0. Manage ICT device assets	3.1. Procure and accept ICT devices. 3.2. Maintain ICT asset inventory. 3.3. Simply repair common faults of ICT devices. 3.4. Evaluate ICT device scrap conditions and make disposal recommendations for scrap devices. 3.5. Manage ICT device appurtenances such as licenses, supplier service agreements, quality assurance. 3.6. Take inventory of ICT assets in the area under the jurisdiction and output the corresponding reports.	**Generic Skills and Knowledge** • Basic skills in Operating Systems • Computer network skills • Hardware skills • Communication and report writing skills • Analytical skills • Analytical and problem-solving skills • Vocational ethical skills • Time management skills **Tools and Equipment** • Barcode reader • Computer **Materials** • Maintenance manuals for related devices • Operating instructions for related devices **Work Behaviors** • Meticulous attention to detail • Strictly abide by the financial, safety and other company systems

DUTIES	TASKS	ENABLERS
4.0. Maintain ICT terminal service software	4.1. Install, upgrade and uninstall common ICT terminal service software. 4.2. Configure and use common ICT terminal service software. 4.3. Diagnose and resolve simple ICT terminal service software faults.	**Generic Skills and Knowledge** • Basic skills in Operating Systems • Computer network skills • Hardware skills • Understand complex systems and how they work together • Eager to learn and master changing technology trends • Communication and report writing skills • Analytical skills • Analytical and problem-solving skills **Tools and Equipment** • Smart terminals • Network packet capture and analysis tools • Computer • Mobile simulation software **Materials** • Software package **Work Behaviors** • Meticulous attention to detail • A logical approach to work
5.0. Maintain ICT server system software	5.1. Installation of server operating systems and server configuration and management. 5.2. Install, upgrade and uninstall ICT server system software. 5.3. Configure and use ICT server system software. 5.4. Diagnose and resolve simple server system software faults. 5.5. Build and provide a remote maintenance environment for server systems.	**Generic Skills and Knowledge** • Basic skills in Operating Systems • Computer network skills • Hardware skills • Basic skills in scripting languages • Database technical skills • Understand complex systems and how they work together • Eager to learn and master changing technology trends • Complex understanding of business requirements,

DUTIES	TASKS	ENABLERS
		processes and structures • Communication and report writing skills • Analytical skills • Analytical and problem-solving skills • Time management skills • Project management skills **Tools and Equipment** • Computer • Enterprise Service Management (ESM) tools • Remote access tools • Database management tools • Antistatic wrist strap • Network packet capture and analysis tools **Materials** • User profiles • User management manual • Software package **Work Behaviors** • Teamwork • Time management • Meticulous attention to detail • A logical approach to work

DUTIES	TASKS	ENABLERS
6.0. Manage small ICT project R&D process	6.1. Reasonably assign ICT project tasks. 6.2. Evaluate the workload of ICT projects. 6.3. Develop ICT project implementation plans. 6.4. Manage ICT project implementation process. 6.5. Evaluate ICT project objectives achievement.	**Generic Skills and Knowledge** • Basic skills in Operating Systems • Basic skills for developing languages • Database technical skills • Understand complex systems and how they work together • Complex understanding of business requirements, processes and structures • Communication and report writing skills • Analytical skills • Outstanding interpersonal skills • Solution development skills • Time management skills • Project management skills • Leadership skills **Tools and Equipment** • Computer • Project management tools **Work Behaviors** • Time management • A logical approach to work

DUTIES	TASKS	ENABLERS
7.0. Implement small ICT project R&D	7.1. Develop ICT project (product) outline design. 7.2. Develop ICT project (product) detailed design. 7.3. Complete coding for one aspect of ICT project (product). 7.4. Complete ICT project (product) integration testing.	**Generic Skills and Knowledge** • Basic skills in Operating Systems • Computer network skills • Basic skills in scripting languages • Basic skills for developing languages • Database technical skills • Eager to learn and master changing technology trends • Complex understanding of business requirements, processes and structures • Time management skills • Teamwork skills **Tools and Equipment** • Computer • Development tools for corresponding languages • Database management tools • Software test management tools • Code management and continuous integration tools **Work Behaviors** • Strong teamwork critical skills • Strong time management skills • A logical approach to work

DUTIES	TASKS	ENABLERS
8.0. Manage enterprise ICT project engineering implementation process	8.1. Supervise the implementation of ICT projects as per industry standards and specifications. 8.2. Evaluate ICT engineering budgets and control enterprise ICT project costs. 8.3. Control ICT project schedule and quality. 8.4. Design and implement indoor distributed system solutions. 8.5. Manage enterprise ICT project documents.	**Generic Skills and Knowledge** • Understand complex systems and how they work together • Complex understanding of business requirements, processes and structures • Communication and report writing skills • Analytical skills • Analytical and problem-solving skills • Outstanding interpersonal skills • Time management skills • Project management skills • Skills to comply with professional ethics • Leadership skills **Tools and Equipment** • Computer • Project management tools **Work Behaviors** • Time management • A logical approach to work

DUTIES	TASKS	ENABLERS
9.0. Develop and improve enterprise ICT products	9.1. Tap into and analyze ICT service needs of enterprises. 9.2. Track and clarify ICT service needs of enterprises. 9.3. Design and prepare enterprise ICT service technical specifications. 9.4. Assess and determine ICT service needs achievement.	**Generic Skills and Knowledge** • Basic skills in Operating Systems • Computer network skills • Basic skills for developing languages • Database technical skills • Hardware skills • Eager to learn and master changing technology trends • Complex understanding of business requirements, processes and structures • Communication and report writing skills • Analytical skills • Solution development skills • Time management skills • Project management skills • Strong written and oral communication skills **Tools and Equipment** • Computer • Interaction design tools software **Work Behaviors** • Meticulous attention to detail • A logical approach to work

DUTIES	TASKS	ENABLERS
10.0. Manage enterprise ICT product or service providers	10.1. Develop enterprise ICT product technical parameters and service agreements. 10.2. Maintain relationships with enterprise ICT product or service providers and build supplier resources. 10.3. Track the product or service delivery process and control delivery risks.	**Generic Skills and Knowledge** • Database technical skills • Computer network skills • Hardware skills • Basic skills in Operating Systems • Basic skills in Cyber Security • Communication and report writing skills • Analytical skills • Ethical skills • Outstanding interpersonal skills • Leadership skills • Solution development skills **Tools and Equipment** • Computer **Work Behaviors** • Patience • Meticulous attention to detail • A logical approach to work