****

**REPUBLIC OF KENYA**

**NATIONAL OCCUPATIONAL STANDARDS**

**FOR**

**ENVIRONMENTAL TECHNOLOGIST**

**LEVEL 6**

**PROGRAMME ISCED CODE: 0521 554 A**

First published 2024

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# FOREWORD

The provision of quality education and training is fundamental to the Government’s overall strategy for social-economic development. Quality education and training will contribute to the achievement of Kenya’s development blueprint, Vision 2030 and sustainable development goals.

Reforms in the education sector are necessary for the achievement of Kenya Vision 2030 and meeting the provisions of the Constitution of Kenya 2010. These reforms resulted to the formulation of the Policy Framework for Reforming Education and Training (Sessional Paper No.14 of 2012). A key feature of this policy is the radical change in the design and delivery of the TVET training. This policy document requires that training in TVET be competency based, certification be based on demonstration of competence and mode of delivery allows for multiple entry and exit in TVET programmes.

The reforms also demand that Industry takes a leading role in curriculum development to ensure the curriculum addresses its competence needs. It is against this background that these Occupational Standards were developed for developing a Competency-Based Education and Training (CBET) curriculum for Occupational Standards for Environmental Technologist Level 6. These Occupational Standards will also be the basis for the assessment of an individual for competency certification.

It is my conviction that these Occupational Standards will play a great role in the development of a competent human resource for sustainable development.

# PREFACE

Kenya Vision 2030 aims to transform the country into a newly industrializing, middle-income country providing a high-quality life to all its citizens by the year 2030. Kenya intends to create a globally competitive and adaptive human resource base to meet the requirements of a rapidly industrializing economy through life-long education and training. TVET has a responsibility of facilitating the process of inculcating knowledge, skills, and attitudes necessary for catapulting the nation to a globally competitive country, hence the paradigm shift to embrace Competency-Based Education and Training (CBET).

The Technical and Vocational Education and Training Act No. 29 of 2013 and Sessional Paper No. 14 of 2012 on Reforming Education and Training in Kenya, emphasized the need to reform curriculum development, assessment and certification. This called for a shift to CBET to address the mismatch between skills acquired through training and skills needed by the industry as well as increase the global competitiveness of the Kenyan labour force.

The National Polytechnics, in conjunction with the industry experts through the Industry Advisory Board (IAB), sector regulator boards, TVETA authority, and qualification awarding institution has developed these Occupational Standards for Environmental Technologist Level 6. The occupational standards will be the basis for the development of a competency-based education and training curriculum for Environmental Technologist Level 6.

I am grateful to the Governing Council Members, TVETA, sector regulators, the industry experts, and subject experts who participated in the development of these standards.

# ACKNOWLEDGMENT

These Occupational Standards were developed through the combined effort of various stakeholders from private and public organizations. I am thankful to the management of these organizations for allowing their staff to participate in this course. I wish to acknowledge the invaluable contribution of industry players who provided input towards the development of these Occupational Standards.

I also thank all the individuals and organizations who participated in the validation of these Occupational Standards.

ACRONYMS

CDACC : Curriculum Development, Assessment and Certification Council

CPU : Central Processing Unit

ENV : Environment

SCI : Science

ICT : Information Communication Technology

KNQA : Kenya National Qualifications Authority

OS : Occupational Standards

OSHA : Occupation Safety and Health Act

OSHS : Occupation Safety and Health Standards

PC : Personal Computer

PPE : Personal Protective Equipment

SOPs : Standard Operating Procedures

SSAC : Sector Skills Advisory Committee

NEMA : National Environmental Management Authority

TVET : Technical and Vocational Education

**KEY TO UNIT CODE**

Sector / Industry

Sub Sector

Occupational Area

Version Control

Unit of Competence Number

ISCED level, Programme Orientation and Level of Completion

xx

x

xxx

x

x

x

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# OVERVIEW

The Environmental Technologist Level 6 occupational standards consists of competencies that a person requires working in an environmental sector. It entails managing environmental pollution, managing environmental waste, performing environmental safeguards and compliance, performing environmental planning and management, carrying out eco-toxicology assessment, and conducting climate change impact assessment.

# SUMMARY OF UNITS OF COMPETENCY

|  |  |
| --- | --- |
| **BASIC UNITS OF COMPETENCY** | |
| UNIT CODE | UNIT TITLE |
| 0611 551 1A | Apply Digital Literacy |
| 0031 541 2A | Apply Communication Skills |
| 0031 541 3A | Apply Work Ethics and Practices |
| 0413 541 4A | Apply Entrepreneurial Skills |
| COMMON UNITS OF COMPETENCY | |
| 0322 541 5A | Apply information systems |
| 0521 541 6A | Apply environmental law |
| 0521 541 7A | Apply basic principles of environment |
| 0711 551 8A | Perform environmental laboratory practice |
| 0111 551 9A | Conduct scientific research |
| 0521 541 10A | Apply natural resource economics |
| 0531 551 11A | Apply inorganic and organic chemistry principles |
| 0512 551 12A | Apply biochemistry principles |
| CORE UNITS OF COMPETENCY | |
| 0521 551 13A | Manage environmental pollution |
| 0521 551 14A | Manage environmental waste |
| 0521 551 15A | Perform environmental safeguards and compliance |
| 0521 551 16A | Perform environmental planning and management |
| 0521 551 17A | Carry out Eco-toxicology assessment |
| 0521 551 18A | Manage climate change impact assessment. |

**BASIC UNITS OF COMPETENCY**

# APPLY DIGITAL LITERACY

UNIT CODE: 0611 551 4A

UNIT DESCRIPTION:

This unit covers the competencies required to demonstrate digital literacy. It involves operating computer devices, solving tasks using the Office suite, accessing online/offline data and information, performing online communication and collaboration, applying cyber-security skills and performing jobs online. It also involves applying job entry techniques.

ELEMENTS AND PERFORMANCE CRITERIA

| ELEMENT  These describe the key outcomes that make up workplace functions | PERFORMANCE CRITERIA  These are assessable statements which specify the required level of performance for each of the elements  (Bold and italicized terms are elaborated in the range) |
| --- | --- |
| * 1. Operate computer devices | * 1. **C*omputer device*** usage is determined as per workplace requirements.   2. ***Computer hardware*** is identified according to job requirements.   3. ***Computer software***is identified according to workplace requirements.   4. Computer devices are turned on or off as per the correct workplace procedure.   5. ***Mouse techniques*** are applied in solving tasks as per workplace requirements.   6. Keyboardtechniques are applied in solving tasks as per workplace requirements.   7. Computer files and folders are created and managed as per workplace requirements.   8. ***Internet connection option*s** are identified and applied in connecting computer devices to the Internet.   9. ***External devices*** are identified and connected to the computer devices as per the job requirement. |
| * 1. Solve tasks using Office suite | * 1. ***Word processing concepts***are applied in solving workplace tasks as per job requirements.   2. Worksheet data is entered and prepared in accordance with work procedures.   3. Worksheet data is built and edited in accordance with workplace procedures.   4. ***Data manipulation*** on a worksheet is undertaken in accordance with work requirements.   5. Worksheets are saved and printed in accordance with job requirements.   6. ***Electronic presentation concepts***are applied in solving workplace tasks as per job requirements. |
| * 1. Manage data and information | * 1. Office ***internet services*** are identified and applied in accordance with office procedures.   2. ***Internet access applications*** are determined in accordance with office operation procedures.   3. Internet search is performed as per job requirements.   4. Online digital content is downloaded in accordance with workplace requirements.   5. Digital content is identified and backed up in accordance with workplace procedures. |
| * 1. Perform online communication and collaboration | * 1. Netiquette principles are observed as per work requirements.   2. Electronic mail communication is executed in accordance with workplace policy.   3. Digital content copyright and licenses are identified and applied according to workplace policies and regulatory requirements.   4. ***Online* *collaboration tools*** are applied in accordance with workplace policies and regulatory requirements. |
| * 1. Apply cyber-security skills | * 1. ***Data protection***and ***privacy***is classified in accordance with workplace policies and regulatory requirements.   2. ***Internet security threats*** are identified as per workplace policies and regulatory requirements.   3. Computer threats and crimes are detected in accordance to Information Management security guidelines   4. ***Cyber-security control measures*** are applied in accordance with workplace policies and regulatory requirements. |
| * 1. Perform online jobs | 1. ***Online job platforms*** are identified as per the job 1requirements. 2. Online accounts and profiles are created in accordance with the work requirements. 3. Online jobs are identified according to the bidder’s skillset. 4. Online digital identity is managed according to industry best practices. 5. Online job bidding is done as per the specific job requirements. 6. Online tasks are executed according to the job requirements. 7. Personal online payment account is managed in accordance with financial regulations. |
| * 1. Apply job entry techniques | * 1. ***Job opportunities***are sought based on competencies.   2. A winning resume/CV is developed as per job advertisement.   3. An application/cover letter is developed based on the job advertisement.   4. Certificates and testimonials are organized as per resume.   5. ***Interview skills*** are demonstrated as per job advertisement. |

RANGE

This section provides a work environment and conditions to which the performance criteria apply. It allows for a different work environment and situations that will affect performance.

| Variable | Range |
| --- | --- |
| 1. Computer devices may include but are not limited to: | * Desktops * Laptops * Smartphones * Tablets * Smartwatches |
| 1. Computer hardware may include but are not limited to: | * The System Unit E.g. Motherboard, CPU, casing, * Input Devices e.g. pointing, keying, scanning, voice/speech recognition, direct data capture devices. * Output Devices e.g. hardcopy output and softcopy output * Storage Devices e.g. main memory e.g. RAM, secondary storage (Solid state devices, Hard Drives, CDs & DVDs, Memory cards, Flash drives * Computer Ports e.g. HDMI, DVI, VGA, USB type C etc. |
| 1. Computer software may include but are not limited to: | * System software e.g. Operating System (Windows, Macintosh, Linux, Android, iOS) * Application Software e.g. Word Processors, Spreadsheets, Presentations etc. * Utility Software e.g. Antivirus programs |
| 1. External devices may include but are not limited to: | * Printers * Projectors * Smart Boards * Speakers * External storage drives * Digital/Smart TVs |
| 1. Word processing concepts may include but are not limited to: | * Creating word documents * Editing word documents * Formatting word documents * Saving word documents * Printing word documents |
| 1. Mouse techniques may include but are not limited to: | * Clicking * Double-clicking * Right-clicking * Drag and drop |
| 1. Internet connection options may include but are not limited to: | * Mobile Networks/Data Plans * Wireless Hotspots * Cabled (Ethernet/Fibber) * Dial-Up * Satellite * ISDN (Integrated Services Digital Network) |
| 1. Data manipulation may include but are not limited to: | * Use of formulae * Use of functions * Sorting * Filtering * Visual representation using charts |
| 1. Electronic presentation concepts may include but are not limited to: | * Creating slides * Editing slides * Formatting slides * Applying slide effects and transitions * Creating and playing slideshows * Saving presentations * Printing slides and handouts |
| 1. Internet services may include but are not limited to: | * Communication Services * Information Retrieval Services * File Transfer * World Wide Web Services * Web Services * Directory Services * Automatic Network Address Configuration * Newsgroup * Ecommerce |
| 1. Internet access applications/software may include but are not limited to: | * Browsers * Email Apps * ecommerce Apps |
| 1. Online collaboration tools may include but are not limited to: | * Online Storage * Online productivity applications * Online meetings, * Online learning environments, * Online calendars * Social networks |
| 1. Data protection and privacy may include but not limited to: | * Confidentiality of data/information * Integrity of data/information * Availability of data/information |
| 1. Internet security threats may include but not limited to: | * Malware attacks * Social engineering attacks * Software supply chain attacks * Advanced persistent threats (APT) * Distributed denial of service (DDoS) * Man-in-the-middle attack (Met) * Password attacks * Iota Attacks * [Phishing Attacks](https://onlinedegrees.sandiego.edu/top-cyber-security-threats/#phishing-attacks) * [Ransomware](https://onlinedegrees.sandiego.edu/top-cyber-security-threats/#ransomware) |
| 1. Security threats control measures may include but not limited to: | * Counter measures against cyber terrorism * Physical Controls * Technical/Logical Controls * Operational Controls |
| 1. Online job platforms may include but are not limited to: | * Remo task * Data annotation.tech * Cloud worker * Up work * Unifoma * Appen |
| 1. Job opportunities may include but not limited to: | * Self-employment * Service provision * product development * salaried employment |
| 1. Certificates and testimonialsmay include but not limited to: | * Academic credentials * Letters of previous employments/ services rendered * Letters of commendation * Certifications of participation * Awards |
| 1. Interview skills may include but not limited to: | * Listening skills * Grooming * Language command * Articulation of issues * Body language * Time management * Honesty * Generally knowledgeable in current affairs and technical area |

REQUIRED KNOWLEDGE AND SKILLS

This section describes the knowledge and skills required for this unit of competency.

Required knowledge

The individual needs to demonstrate knowledge of:

* Computer Hardware and Software Concepts
* Computer Security Concepts (Data security and privacy)
* Cyber security threats and control measures
* Understanding Computer Crimes
* Detection and protection against computer crimes
* Laws governing protection of ICT in Kenya
* Digital Identity Management
* Netiquette Principles
* Fundamentals of Copyright and Licenses
* Word processing;
* Functions and concepts of word processing;
* Documents and tables creation and manipulations;
* Document editing;
* Document formatting;
* Word processing utilities
* Spreadsheets;
* Meaning, types and importance of spreadsheets;
* Components of spreadsheets;
* Functions, formulae, and charts, uses and layout;
* Data formulation, manipulation and application to cells;
* Editing & formatting spreadsheets;
* Presentation Packages;
* Types of presentation Packages.
* Creating, formulating, running, editing, printing and presenting slides and handouts
* Networking and Internet;
* Internet connectivity.
* Browser and digital content management;
* Managing data, information, and digital content
* Electronic mail and World Wide Web
* Fundamentals of Online Working;
* Online Profile Management;
* e-Portfolio Management;
* Online Jobs Bidding;
* Online Payment Systems;
* Job entry techniques
* Job searching sites
* Interview preparation skills
* Interview handling

Required skills

The individual needs to demonstrate the following skills:

* Active listening
* Keyboard Skills
* Mouse Skills
* Analytical skills
* Creativity
* Interpretation Skills
* Communication
* Spreadsheet operations (applying fundamental operations such as addition, subtraction, division and multiplication)
* Computer Use Safety Skills
* Document Editing Skills
* Document Formatting Skills
* Document Printing Skills
* Netiquette Skills
* Internet Browsing Skills
* Problem Solving Skills
* Online Collaboration Skills
* Cybersecurity Skills
* CV writing
* grooming

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required knowledge, and skills range.

|  |  |
| --- | --- |
| * + - 1. Critical aspects of competency | Assessment requires evidence that the candidate:   * 1. Operated computer devices as per workplace policies and regulations.   2. Solved tasks using the office suite as per workplace policies and regulations.   3. Manage data and information as per workplace policies and regulations.   4. Performed online communication and collaboration as per workplace policies and regulations.   5. Applied cyber-security skills in accordance with workplace policies and regulations.   6. Executed online tasks according to the job requirements.   7. Searched for job opportunity based on competencies.   8. Prepared job requirement documentations based on job opportunity.   9. Demonstrated interview skills based on the job opportunity. |
| 1. Resource implications | The following resources should be provided:   * 1. Appropriately simulated environment where assessment can take place.   2. Access to relevant work environments where assessment can take place.   3. Resources relevant to the proposed activities or task. |
| 1. Methods of assessment | Competency in this unit may be assessed through:   * 1. Observation   2. Oral assessment   3. Portfolio of evidence   4. Interviews   5. Third party report   6. Written assessment   7. Practical assessment   8. Projects |
| 1. Context of assessment | Competency may be assessed:   * 1. Workplace   2. Simulated work environment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector and workplace job role is recommended. |

# APPLY COMMUNICATION SKILLS

UNIT CODE: 0031 541 2A

UNIT DESCRIPTION

This unit covers the competencies required to demonstrate communication skills. It involves applying communication channels, written, non-verbal, oral, and group communication skills.

ELEMENTS AND PERFORMANCE CRITERIA

| ELEMENT  These describe the key outcomes that make up workplace function | PERFORMANCE CRITERIA  These are assessable statements that specify the required level of performance for each of the elements.  Bold and italicized terms are elaborated in the Range |
| --- | --- |
| Apply communication channels | * 1. Specific communication channels are identified and applied based on workplace requirements.   2. Challenges are identified and addressed as per the operational standards of the organization.   3. Communication channels are evaluated to meet workplace needs. |
| * + - 1. Apply written communication skills | * 1. Types of written communication are identified and applied according to the workplace requirements.   2. Written communication needs are identified and implemented according to workplace procedures.   3. Written communication guidelines are analysed, evaluated, and revised based on workplace needs. |
| * + - 1. Apply non-verbal communication skills | 3.1 Existing non-verbal communication techniques are identified and applied based on organization policy.  3.2 Non-verbal communication techniques are articulated and modeled to enhance inclusivity according to workplace requirements. |
| * + - 1. Apply oral communication skills | 4.1 Types of oral communication are identified and established as per organization policy.  4.2 Pathways of oral communication are identified and established as per organization policy.  4.3 Pathways of oral communication are reviewed according to organization procedures.  4.4 Pathways of oral communication are maintained according to the organization standards. |
| * + - 1. Apply group communication skills | * 1. Group communication strategies are appliedbased on the workplace needs.   2. Groups are organized in accordance with workplace procedures.   3. Effective questioning, listening and non-verbal communication techniques are used as per needs.   5.4 Group communication challenges are identified and addressed according to the workplace needs. |

RANGE

This section provides the work environment and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

| Variable | Range |
| --- | --- |
| Communication strategies may include but are not limited to: | * Language switch * Comprehension check * Repetition * Asking confirmation * Paraphrasing * Clarification request * Translation * Restructuring * Generalization |
| Effective group interaction may include but not limited to: | * Identifying and evaluating what is occurring within an interaction in a non-judgmental way. * Using active listening. * Making decision about appropriate words, behaviour. * Putting together response which is culturally appropriate. * Expressing an individual perspective. * Expressing own philosophy, ideology and background and exploring impact with relevance to communication |
| Situations may include but are not limited to: | * Establishing rapport * Eliciting facts and information * Facilitating resolution of issues * Developing action plans |

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

Required Skills

The individual needs to demonstrate the following skills:

* Active listening
* Interpretation
* Negotiation
* Writing
* Oral skills
* Creative thinking
* Critical thinking
* Decision making
* Analytical
* Innovation
* Conflict skills
* Leadership
* Problem solving skills
* Management
* Organizational
* Teamwork

Required Knowledge

The individual needs to demonstrate knowledge of:

* Communication process
* Dynamics of groups
* Styles of group leadership
* Key elements of communications strategy
* Principles of effective communication
* Turn-taking techniques
* Conflict resolution techniques
* Work planning
* Work organization
* Company policies
* Company operations and procedure standards
* Fundamental rights at the workplace
* Personal hygiene
* Accountability
* Workplace problems and how to deal with them

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills, knowledge, and range.

|  |  |
| --- | --- |
| * + - 1. Critical aspects of Competency. | Assessment requires evidence that the candidate:   * 1. Identified and applied specific communication channels based on workplace requirements.   2. Identified and applied specific written communication correspondence according to the workplace requirements.   3. Applied and developed non-verbal strategies to communicate in all areas of the workplace requirements.   4. Established pathways of oral communication as per workplace policy.   5. Applied group communication strategies based on workplace needs. |
| * + - 1. Resource Implications | The following resources should be provided:   1. Access to relevant workplace where assessment can take place. 2. Appropriately simulated environment where assessment can take place. 3. Resources relevant to the proposed activity or tasks. |
| * + - 1. Methods of Assessment | Competency in this unit may be assessed through:   * 1. Observation   2. Oral assessment   3. Portfolio of evidence   4. Interviews   5. Third party report   6. Written assessment   7. Practical assessment   8. Projects |
| * + - 1. Context of Assessment | Competency may be assessed:   * 1. Workplace   2. Simulated work environment |
| * + - 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

**APPLY WORK ETHICS AND PRACTICES**

UNIT CODE: 0031 541 3A

UNIT DESCRIPTION

This unit covers competencies required to effectively apply work ethics and practices. It involves the ability to: conduct self-management, promote ethical work practices and values, promote teamwork, manage workplace conflicts, maintain professional and personal development, apply problem-solving and promote customer care.

ELEMENTS AND PERFORMANCE CRITERIA

| ELEMENT  These describe the key outcomes which make up workplace function. | PERFORMANCE CRITERIA  These are assessable statements which specify the required level of performance for each of the elements.  Bold and italicized terms are elaborated in Range |
| --- | --- |
| Apply self-management skills | * 1. Personal vision, mission and goals are formulated based on potential and concerning organization objectives and strategic plan   2. Self-esteem and a positive self-image are developed and maintained based on value   3. Emotional intelligence and stress management are demonstrated as per workplace requirements.   4. Assertiveness is developed and maintained based on the requirements of the job.   5. Accountability and responsibility for one's actions are demonstrated based on workplace instructions.   6. Time management, attendance and punctuality are observed as per the organization’s policy.   7. Personal goals are managed as per the organization’s objective   8. Self-strengths and weaknesses are identified based on personal objectives   9. Motivation, initiative and proactivity are utilized as per the organization policy   10. Individual performance is evaluated and monitored according to the agreed targets. |
| Promote ethical work practices and values | * 1. Integrity is demonstrated as per acceptable norms   2. Codes of conduct is applied as per the workplace requirements   3. Policies and guidelines are observed as per the workplace requirements   4. Professionalism is exercised in line with organizational policies |
| Promote Team work | 3.1 ***Teams*** are formed to enhance productivity based on organization’s objectives  3.2 Duties are assigned to teams under the organization policy.  3.3 Team activities are managed and coordinated as per set objectives.  3.4 Team performance is evaluated based on set targets as per workplace policy.  3.5 ***Conflicts*** are resolved between team members in line with organization policy.  3.6 Gender and diversity-related issues are identified and mainstreamed in accordance with workplace policy.  3.7 Healthy ***relationships*** are developed and maintained in line with the workplace.  3.8 Adaptability and flexibility are applied in dealing with team members as per workplace policies |
| Maintain professional and personal development | 4.1 ***Personal growth and development*** needs are identified and assessed in line with the requirements of the job.  *4.2* ***Training and career opportunities*** are identified and utilized based on job requirements.  4.3 ***Resources*** for training are mobilized and allocated based on organizations and individual skills needs.  4.4 Licenses and certifications relevant to the job and career are obtained and renewed as per policy.  4.5 Recognitions are sought as proof of career advancement in line with professional requirements.  4.6 Work priorities and personal commitments are balanced and managed based on the requirements of the job and personal objectives.  4.7 Dynamism and on-the-job learning are embraced in line with the organization’s goals and objectives. |
| Apply Problem solving skills | 5.1 ***Creative, innovative*** and practical solutions are developed based on the problem  5.2 Independence and initiative in identifying and solving problems are demonstrated based on the requirements of the job.  5.3 Team problems are solved as per the workplace guidelines  5.4 Problem-solving strategies are applied as per the workplace guidelines  5.5 Problems are analyzed and assumptions tested as per the context of data and circumstances |
| * + - 1. Promote Customer Care | 6.1 Customers' needs are identified based on their characteristics  6.2 Customer ***feedback*** is allowed and facilitated in line with organization policies.  6.3 Customer concerns and complaints are analyzed and resolved in line with the set organizational culture.  6.4 Proactive customer outreach programs are implemented as per organizational policies  6.5 Customer retention strategies are developed and implemented in line with the organizational policy |

RANGE

This section provides work environment and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

| Variable | Range |
| --- | --- |
| 1. Feedback may include but not limited to: | * Verbal * Written * Informal * Formal |
| 1. Conflicts include but are not limited to: | * Interpersonal Conflict. * Intrapersonal Conflict. * Intergroup Conflict. * Intragroup Conflict. |
| 1. Relationships may include but not limited to: | * Man/Woman * Trainer/trainee * Employee/employer * Client/service provider * Husband/wife * Boy/girl * Parent/child * Sibling relationships |
| 1. Team may include but not limited to: | * Small work group * Staff in a section/department * Inter-agency group * Virtual teams |
| 1. Personal growth may include but not limited to: | * Growth in the job * Career mobility * Gains and exposure the job gives * Net workings * Benefits that accrue to the individual as a result of noteworthy performance |
| 1. Personal objectives may include but not limited to: | * Long term * Short term * Broad * Specific |
| 1. Trainings and career opportunities may include but not limited to | * Participation in training programs * Serving as Resource Persons in conferences and workshops * Capacity building |
| 1. Resource may include may but not limited to: | * Human * Financial * Technology |
| 1. Creative and innovative may include but not limited to: | * New ideas * Original ideas * Different ideas * Methods/procedures * Processes * New tools |
| 1. Emerging issues may include but not limited to: | * Artificial Intelligence * Data confidentiality * National cohesion * Open offices |

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

Required Skills

The individual needs to demonstrate the following skills:

* Active listening
* Critical thinking
* Organizational
* Negotiation
* Monitoring
* Evaluation
* Problem solving
* Decision Making
* Leadership
* Creative/innovative thinking
* Adaptability
* Conflict management
* Emotional intelligence
* Teamwork

Required Knowledge

The individual needs to demonstrate knowledge of:

* Work values and ethics
* Company policies and procedures
* Company operations, procedures and standards
* Flexibility and adaptability
* Concept of time and leisure time
* Decision making
* Work planning
* Organizing work
* Monitoring and evaluation
* Record keeping
* Gender and diversity mainstreaming
* Drug and substance abuse
* Professional growth and development
* creativity
* Innovation
* problem solving
* customer care
* Mentoring and coaching.
* Emerging issues

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |
| --- | --- |
| * Critical aspects of Competency | Assessment require evidence that the candidate:   * 1. Applied self-management skills as per organizational procedures.   2. Promoted ethical practices and values as per organizational procedures.   3. Promoted Teamwork as per workplace assignments.   4. Maintained professional and personal development as per organizational procedures.   5. Applied Problem-solving skills based on work requirements.   6. Identified customer needs based on their characteristics.   7. Gave back Customer feedback in line with organization policies. |
| 1. Resource Implications | The following resources should be provided:   * 1. Access to relevant workplace where assessment can take place   2. Appropriately simulated environment where assessment can take place.   3. Resources relevant to the proposed activity or tasks. |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   * 1. Observation   2. Oral questioning   3. Written test   4. Portfolio of Evidence   5. Interview   6. Third party report |
| 1. Context of Assessment | Competency may be assessed:   * 1. Workplace   2. Simulated work environment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

# APPLY ENTREPRENEURIAL SKILLS

UNIT CODE: 0413 541 4A

UNIT DESCRIPTION

This unit covers the competencies required to demonstrate an understanding of entrepreneurship. It involves demonstrating an understanding of financial literacy, applying entrepreneurial concepts identifying entrepreneurship opportunities, applying business legal aspects, developing business innovative strategies, and developing business plans.

ELEMENTS AND PERFORMANCE CRITERIA

| ELEMENT  These describe the key outcomes that make up workplace function. | PERFORMANCE CRITERIA  These are assessable statements that specify the required level of performance for each of the elements.  Bold and italicized terms are elaborated in Range |
| --- | --- |
| 1. Apply Financial Literacy Skills | * 1. Sources of personal and business ***funds*** are identified as per financial procedures and standards   2. Personal finances are managed as per financial procedures and standards   3. Savings are managed as per financial procedures and standards   4. Debts are managed as per financial procedures and standards   5. Investments are undertaken as per financial procedures and standards   6. Insurance services are procured as per financial procedures and standards |
| 1. Apply entrepreneurial concept | * 1. Entrepreneurs and Business persons are distinguished as per principles of entrepreneurship   2. ***Types of entrepreneurs*** are identified as per principles of entrepreneurship   3. Ways of becoming an entrepreneur are identified as per principles of Entrepreneurship   4. ***Characteristics of Entrepreneurs*** are identified as per principles of Entrepreneurship   5. Salaried employment and self-employment are distinguished as per principles of entrepreneurship   6. ***Requirements for entry into self-employment*** are identified according to business procedures and standards   7. Roles of an Entrepreneur in an enterprise are determined according to business procedures and standards   8. Contributions of entrepreneurship to National development are identified as per business procedures and standards |
| 1. Identify entrepreneurial opportunities | * 1. Business ideas are identified as per business procedures and standards   2. Factors to consider when evaluating business opportunity viability are explored based on business procedure and standards   3. Entrepreneurial opportunities are evaluated as per business procedures and standards   4. Business ideas and opportunities are generated as per business procedures and standards   5. Business life cycle is analysed as per business procedures and standards |
| 1. Apply business legal aspects | * 1. ***Forms of business ownership*** are identified as per legal procedures and practices   2. Business Registration and Licensing processes are identified as per legal procedures and practices   3. Types of Contracts and Agreements are analysed as per legal procedures and practices   4. Employment Laws are identified as per legal procedures and practices   5. Taxation laws are identified as per legal procedures and practices |
| 1. Innovate Business strategies | * 1. Business innovation strategies are determined by the organization standards   2. Creativity in business development is demonstrated in accordance with business standards   3. ***Innovative business standards***are developed as per business principles   4. Linkages with other entrepreneurs are created as per best practice   5. ICT is incorporated in business growth and development as per best practice |
| 1. Develop Business Plan | * 1. Business idea is described as per business procedures and standards   2. Business description is developed as per business plan format   3. Marketing plan is developed as per business plan format   4. Organizational/Management plan is prepared in accordance with business plan format   5. Production/operation plan is prepared in accordance with business plan format   6. Financial plan is prepared in accordance with the business plan format   7. Executive summary is prepared in accordance with business plan format   8. Business plan is presented as per best practice   9. Business ideas are incubated as per institutional policy. |

RANGE

This section provides work environment and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

| Variable | Range |
| --- | --- |
| * + - 1. Sources of personal funds may include but not limited to: | * Salary/Wages * Investments * Savings * Inheritance * Government Benefits |
| 1. Sources of business finance may include but not limited to: | * Equity Financing * Debt Financing, * Personal Savings/Investment * Retained Earnings * Grants and Subsidies * Crowdfunding * supplier Credit: * Leasing and Asset Financing: |
| 1. Types of entrepreneurs may include but not limited to: | * Innovators * Imitators * Craft * Opportunistic * Speculators |
| 1. Characteristics of Entrepreneurs may include but not limited to: | * Creative * Innovative * Planner * Risk taker * Networker * Confident * Flexible * Persistent * Patient * Independent * Future oriented * Goal oriented |
| 1. Requirements for entry into self-employment may include but not limited to | * Technical skills * Management skills * Entrepreneurial skills * Resources * Infrastructure |
| 1. Forms of businesses ownership may include but not limited to: | * Sole proprietorship * Partnership * Limited companies * Cooperatives |
| 1. Innovative business standards may include but not limited to: | * New products * New methods of production * New markets * New sources of supplies * Change in industrialization |

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

Required Skills

The individual needs to demonstrate the following skills:

* Analytical
* Management
* Problem-solving
* Root-cause analysis
* Communication

Required Knowledge

The individual needs to demonstrate knowledge of:

* Decision making
* Business communication
* Change management
* Competition
* Risk
* Net working
* Time management
* Leadership
* Factors affecting entrepreneurship development
* Principles of Entrepreneurship
* Features and benefits of common operational practices, e. g., continuous improvement (kaizen), waste elimination,
* Conflict resolution
* Health, safety and environment (HSE) principles and requirements
* Customer care standards
* Basic financial management
* Business strategic planning
* Impact of change on individuals, groups and industries
* Government and regulatory processes
* Local and international market trends
* Product promotion standards
* Market and feasibility studies
* Government and regulatory processes
* Local and international business environment
* Relevant developments in other industries
* Regional/ County business expansion standards

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |
| --- | --- |
| * + - 1. Critical Aspects of Competency | Assessment requires evidence that the candidate:   * 1. Identified Sources of personal and business finance as per financial procedures and standards   2. Managed Personal finances as per financial procedures and standards   3. Made Investment decisions as per financial procedures and standards   4. GeneratedBusiness ideas and opportunities based on business procedure and standards   5. Analysed business life cycle based on business procedure and standards   6. Determined business innovative standards as per business principles   7. Developed and presented a business plan as per regulatory framework. |
| * + - 1. Resource Implications | The following resources should be provided:   * 1. Access to relevant workplace where assessment can take place   2. Appropriately simulated environment where assessment can take place |
| * + - 1. Methods of Assessment | Competency may be assessed through:   * 1. Written tests   2. Oral questions   3. Third party report   4. Interviews   5. Portfolio |
| * + - 1. Context of Assessment | Competency may be assessed:   * 1. Workplace   2. Simulated work environment |
| * + - 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

# 

# COMMON UNITS

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# APPLY INFORMATION SYSTEMS

UNIT CODE: 0322 541 5A

UNIT DESCRIPTION

This unit covers the competencies required to apply information systems it involves Applying GIS and remote sensing techniques, performing geo-graphic communication and, producing geo-maps.

ELEMENTS AND PERFORMANCE CRITERIA

|  |  |
| --- | --- |
| ELEMENT  These describe the key outcomes which make up workplace functions | PERFORMANCE CRITERIA  These are assessable statements which specify the required level of performance for each of the elements  (Bold and italicized terms are elaborated in the range) |
| 1 Apply GIS and remote sensing techniques | 1.1 Data is ***collected*** in line with ISO 19115  1.2 Data is processed as per ISO 19115  1.3 Watersheds are delineated as per Water Act 2016  1.4 Natural resources are analysed as per EMCA review 2019  1.5 Natural resources are monitored as per ISO 19115 |
| 2 Perform geo-graphic communication | 2.1 Data is ***collected*** based on the type of resource  2.2 Digital maps developed to scale as per Open Geospatial Consortium  2.2 Digital maps presented to scale as per Open Geospatial Consortium  2.3 Graphs are generated as per Open Geospatial Consortium  2.4 Images are geo-referenced and processed as per Open Geospatial Consortium.  2.5 Digital models are generated from raw data as per Open Geospatial Consortium |
| 3. Produce geo-maps | 3.1 Maps are generated as per Federal Geographic Data Committee  3.2 Maps are designed and compiled as per Federal Geographic Data Committee  3.3 ***Map projections Coordinate reference*** systems are applied a per Federal Geographic Data Committee |

RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

|  |  |
| --- | --- |
| Variable | Range |
| 1. Collected includes but not limited to: | * + - * GNSS receivers       * Aerial photography       * Remote sensing       * Radar |
| 2.Coordinate reference systems includes but not limited to: | * + - * Geographical coordinates       * Projected Coordinate system |
| 3. Map projections includes but not limited to: | * + - * UTM (Universal Transverse Mercator)       * UPS (Universal Polar Stereographic) |

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

Required Skills

The individual needs to demonstrate the following skills:

* + - * ICT skills
      * Operating GNSS receivers
      * Geo-referencing
      * Collecting data
      * Taking aerial photographs
      * Scanning maps
      * Layering features
      * Interpretation
      * Presentation
      * Mathematical skills
      * Designing maps

Required knowledge

The individual needs to demonstrate knowledge of:

* Map layout
* Geographical information systems
* Types of GNSS receivers
* Aerial photography
* Digital models
* Watershed delineation
* Remote sensing
* Data processing
* Data presentation
* Mapping scales
* Map projections
* Geo-referencing
* Map design
* Reference systems

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |
| --- | --- |
| 1. Critical aspects  of Competency | Assessment requires evidence that the candidate:   * 1. ***Collected*** data in line with ISO 19115   2. Analysed natural resources as per EMCA review 2019   3. Presented digital maps to scale as per Open Geospatial Consortium   4. Designed and compiled maps as per Federal Geographic Data Committee |
| 2.Resource Implications | The following resources should be provided:   * 1. Access to relevant workplace or appropriately simulated environment where assessment can take place   2. Materials relevant to the proposed activity or tasks |
| 3.Methods of Assessment | Competency in this unit may be assessed through:   * 1. Observation   2. Oral questioning   3. Written test   4. Portfolio of Evidence   5. Interview      + 1. Third party report |
| 4. Context of Assessment | Competency may be assessed:   * 1. Workplace   2. Simulated work environment |
| 5.Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

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# APPLY ENVIRONMENTAL LAW

UNIT CODE: 0521 541 6A

UNIT DESCRIPTION

This unit covers the competencies required to apply environmental law. It involves applying national and regional laws, applying multi-lateral policies, treaties and determining environmental law.

ELEMENTS AND PERFORMANCE CRITERIA

|  |  |
| --- | --- |
| ELEMENT  These describe the key outcomes which make up workplace functions | PERFORMANCE CRITERIA  These are assessable statements which specify the required level of performance for each of the elements  (Bold and italicized terms are elaborated in the range) |
| * Apply national and regional laws | * 1. Objectives and ***guiding principles*** are determined as per national environment policy, 2013   2. management of ecosystems and ***sustainable natural resource*** use as per national environment policy, 2013   3. Environmental stewardship as per national environment policy, 2013   4. Environmental quality and health as per national environment policy,2013   5. Environmental governance laws are determined as per national environment policy, 2013 |
| * Apply multi-lateral policies, treaties | * 1. ***Biodiversity*** conservation and sustainable use principles are applied as per international environmental laws 2017   2. ***land management laws*** are applied as per international environmental laws 2017   3. Management of international watercourses law is applied as per international environmental laws 2017   4. Marine environment protection laws are applied as per international environmental laws 2017   5. **O*zone layer laws*** are applied as per international environmental laws 2017   6. **C*limate change response protocols*** are applied international environmental laws 2017   7. Waste management convection is applied as per international environmental laws 2017   8. chemical management convections are applied as per international environmental laws 2017 |
| 3. Determine environmental law enforcement | * 1. Implementation strategies and actions are applied as per national environment policy, 2013   2. Research ,education and monitoring laws are applied as per national environment policy, 2013   3. Implementation bodies are applied as per national environmental policy 2023 |

RANGE

This section provides work environment and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance

|  |  |
| --- | --- |
| Variable | Range |
| Guiding principles may include but are not limited to: | * polluter pays principle, precautionary principle * preventative principle * principle of sustainable development, * public participation and integration. |
| Sustainable resource use may include but are not limited to: | * Reducing * Reusing * Recycling * Repairing, or replacing your resources * Switching to more efficient * Renewable, or low-impact alternatives |
| Biodiversity may include but are not limited to: | * Genetic diversity * Species diversity * Ecosystem diversity. |
| Land management laws may include but are not limited to: | * National lands commission Act 2012 * Forest Act 2005 |
| Ozone layer laws may include but are not limited to: | * Vienna convention for Protection of the Ozone layer * Montreal protocol on substances that deplete the Ozone layer |
| Climate change response protocols may include but are not limited to: | * Climate change ACT 2016 * Kyoto Protocol * United Nations Convention on Climate Change UNFCC |

REQUIRED KNOWLEDGE AND SKILLS

This section describes the knowledge and skills required for this unit of competency.

Required knowledge

The individual needs to demonstrate knowledge of:

Examples:

* Law
* Sources of law
* Types of law
* Enforcement methods
* Enforcement bodies
* Conventions
* Treaties
* International environmental law

Required skills

The individual needs to demonstrate the following skills:

* Active listening
* Reflecting
* Paraphrasing
* Clarifying
* Questioning
* Basic ICT
* Critical thinking
* Writing
* Problem solving
* Analytical

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required knowledge and skills range.

|  |  |
| --- | --- |
| * + - 1. Critical aspects of competency | Assessment requires evidence that the candidate:   * 1. Applied national and regional laws,as per national environment policy, 2013   2. Applied multi-lateral policies, treaties as per national environment policy, 2013   3. Determined environmental law enforcement as per national environment policy, 2013 |
| * + - 1. Resource implications | The following resources should be provided:   * 1. Appropriately simulated environment where assessment can take place   2. Access to relevant work environment   3. Resources relevant to the proposed activities or tasks |
| * + - 1. Methods of assessment | Competency in this unit may be assessed through:  Observation   * 1. Oral questioning   2. Portfolio of evidence   3. Interviews   4. Third party report   5. Written tests |
| * + - 1. Context of assessment | Competency may be assessed:   * 1. Workplace   2. Simulated work environment |
| * + - 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector and workplace job role is recommended. |

**BASIC PRINCIPLES OF ENVIRONMENT**

UNIT CODE: 0521 541 7A

UNIT DESCRIPTION

This unit covers the competencies required to apply basic principles of enviroment it involves Applying principles of ecology, demonstrating sustainable resource use, demonstrating resource conservation plans and, monitoring environmental programs.

ELEMENTS AND PERFORMANCE CRITERIA

|  |  |
| --- | --- |
| ELEMENT  These describe the key outcomes which make up workplace functions | PERFORMANCE CRITERIA  These are assessable statements which specify the required level of performance for each of the elements  (Bold and italicized terms are elaborated in the range) |
| Apply principles of ecology | * 1. ***Environmental components*** are monitored as per biodiversity BC 2017   2. ***Bio-geochemical cycles***are identified as per CBD 2017   3. Ecosystemsare monitored as per biodiversity BC 2017 ***Ecological interactions*** are determined as per CBD 2017   4. Current environmental issues are mapped as per CBD 2017 |
| Demonstrate sustainable resource use | * 1. Methods for minimizing resource wastage are identified as per Kenya state environmental report 2019-2021.   2. Methods for reducing resource consumption are applied as per Kenya state environmental report 2019-2021.   3. ***Resource efficiency systems*** are identified as per Kenya state environmental report 2019-2021.   4. All resource consuming processes are identified as per Kenya state environmental report 2019-2021. |
| 3. Demonstrate resource conservation plans | * 1. Quantity and nature of Resource consumed is determined as per national environment policy, 2013   2. Resource flow is analyzed through different parts of the process as per national environment policy, 2013   3. Resource conflicts are resolved as per national environment policy, 2013   4. **Resource *conservation plans*** are developed as per national environment policy, 2013 |
| 4. Monitor environmental programs | * 1. Programs are identified according to organizations guidelines as per national environment policy, 2013.   2. Problems encountered are resolved in accordance with organizations’ policies and guidelines   3. Stakeholders are consulted based on company guidelines national environment policy, 2013   4. Activities are Evaluated according to the objectives of the environmental program   5. Feedback from stakeholders based on consultations   6. Data gathered are analyzed based on Evaluation requirements   7. Recommendations are submitted based on the findings   8. Management support systems are set to sustain and enhance the program   9. Environmental incidents are monitored and submitted |

RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

|  |  |
| --- | --- |
| Variable | Range |
| 1. Environmental components include but are not limited to | * Atmosphere * Lithosphere * Hydrosphere * Biosphere |
| 2.biogeochemical cycles may include but are not limited to: | * Water * Carbon * Nitrogen * Phosphorus * Sulphur |
| Ecosystems | * Forest ecosystems * Desert * Aquatic * Grassland * Marine |
| Ecological interactions | * Predation * Competition * Mutualism * Parasitism |
| Conservation plans | * *Ex situ* conservation * *In situ* conservation * Protected areas |
| Resource wastage minimization | * Green energy * Climate smart agriculture * Eco tourism * Recycling * Reuse * Reduce |

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

Required Skills

The individual needs to demonstrate the following skills:

* Checking resource use plans
* Complying to regulations/licensing requirements
* Determining benefit/cost of plans
* Ranking proposals based on benefit/cost compared to limited resources
* Checking proposals meet regulatory requirements
* Monitoring implementation
* Making adjustments to plan and implementation
* Checking new resource usage

Required Knowledge

The individual needs to demonstrate knowledge of:

* Determination of quantity and nature of resource consumed
* Analysis of resource flow of different parts of the resource flow process
* Use/conversion of resources
* Causes of low efficiency of use
* Increasing the efficiency of resource use
* Components of proposals
* Criteria on ranking proposals
* Regulatory requirements
* Proposals for improving resource efficiency
* Implementation of resource efficiency plans
* Procedures in monitor implementation
* Adjustments of implementation plan
* Inspection of new resource usage

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |
| --- | --- |
| Critical Aspects of Competency | Assessment requires evidence that the candidate:   * 1. Determined ecological interactions as per CBD   2. Mapped current environmental issues as per CBD 2017   3. Applied methods for reducing resource consumption as per Kenya state environmental report 2019-2021.   4. Analyzed resource flow through different parts of the process as per national environment policy, 2013   5. Resolved resource conflicts as per national environment policy, 2013   6. Sustained and enhanced management support systems set to the program as per work procedures   7. monitored and submitted environmental incidents as per work procedures |
| Resource Implications | The following resources should be provided:   * 1. Workplace with storage facilities   2. Tools, materials and equipment relevant to the tasks (e.g. Cleaning tools, cleaning materials, trash bags)   3. PPE, manuals and references   4. Legislation, policies, procedures, protocols and local ordinances relating to environmental protection   5. Case studies/scenarios relating to environmental Protection |
| Methods of Assessment | Competency in this unit may be assessed through:   * 1. Demonstration   2. Oral questioning   3. Written examination   4. Interview/Third Party Reports   5. Portfolio (citations/awards from GOs and NGOs, certificate of training – local and abroad)   6. Simulations and role-play |
| Context of Assessment | Competency may be assessed:   * 1. Workplace   2. Simulated work environment |
| Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

# PERFORM ENVIRONMENTAL LABORATORY PRACTICE

UNIT CODE: 0711 551 8A

UNIT DESCRIPTION

This unit covers the competencies required to perform environmental laboratory practice it involves developing a laboratory layout, maintaining lab safety, administering first aid, installing laboratory equipment, handling laboratory animals and plants and producing a laboratory report.

ELEMENTS AND PERFORMANCE CRITERIA

|  |  |
| --- | --- |
| ELEMENT  These describe the key outcomes which make up workplace functions | Performance criteria  These are assessable statements which specify the required level of performance for each of the elements  (bold and italicized terms are elaborated in the range) |
| 1. Develop laboratory layout | * 1. Main features of a *lab layout* are determined as per work procedures   2. Laboratory design is drawn as per work procedures   3. Arrangement is maintained as per work procedures |
| 1. Maintain lab safety | 1. S*ources of danger* in the lab are mapped as per OSHA 2007 2. S*afety precaution measures* are maintained as per OSHA 2007 3. Laboratory occupational, health and safety operation policy as per OSHA 2007 4. Laboratory accidents are recorded as per OSHA 2007 |
| 1. Administer first aid | * 1. First aid kit is equipped as per OSHA 2007   2. Administer first aid as per OSHA 2007   3.3 First aid communication is carried out as per OSHA 2007 |
| 4. Install laboratory equipment | 1. Laboratory equipment are calibrated as per SOPs 2. *Laboratory equipment* are serviced as per SOPs 3. Laboratory equipment’s are cleaned as per SOPs |
| 5. Handle laboratory animals and plants | * 1. Taxidermy procedures is conducted a per Animal disease act 2012   2. Inoculation methods are performed on animals Animal disease act 2012   3. Plant specimen preservation is done per national museum and heritage act 2006   4. Ante-mortem is performed on animal species as per Animal disease act 2012   5. Specimen are disposed safely as per OSHA 2007 |
| 6. Produce laboratory report. | * 1. Organization structure of the lab is developed as per SOPs   2. Reports are filed   3. Lab documentations are stored as per SOPs |

RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

|  |  |
| --- | --- |
| Variable | Range |
| 1. Lab layout includes but not limited to: | * Fittings * Storage * Service * Drainage * Gangways |
| 2. Lab equipment includes but not limited to: | * Balances * Mercury barometers * Galvanometer * Glass bowers * Heavy equipment * Laboratory stills * Spectrographic equipment * Bunsen burner * Fire extinguishers |
| 3. Source of danger includes but not limited to: | * Glass * Chemicals * Fire-chemicals * Explosions * Gas cylinders * Electricity * Radiation |
| 4. Safety precaution measures includes but not limited to: | * PPEs use * No beverages or food in the lab * No running in the lab * No practical’s without supervision |

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

Required Skills

The individual needs to demonstrate the following skills:

* Setting up equipment
* Performing first aid
* Preparing reagents
* Breeding animals and plants.
* Performing post mortem
* Housekeeping skills
* Labelling
* Producing photographs
* Keeping records
* Report writing
* Supervisory skills
* Communication skills
* Basic ICT skills

Required knowledge

The individual needs to demonstrate knowledge of:

* Organization of lab
* Lab rules and regulations
* Lab layout
* Photography
* Solutions and reagents
* First aid
* Safety precautions
* Lab equipment, tools and materials
* Lab animals and plants.
* Preservation of specimens

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |
| --- | --- |
| Critical aspects of Competency | Assessment requires evidence that the candidate:   * 1. Determined main features of a lab layout as per work procedures   2. Maintained safety precaution measures as per OSHA 2007   3. Administered first aid as per OSHA 2007   4. Carried out first aid communication as per OSHA 2007   5. Cleaned laboratory equipment’s as per SOPs   6. Plant specimen preservation was done per national museum and heritage act 2006   7. Disposed specimen safely as per OSHA 2007 |
| Resource Implications | The following resources should be provided:   * 1. Access to relevant workplace or appropriately simulated environment where assessment can take place   2. Materials relevant to the proposed activity or tasks |
| Methods of Assessment | Competency in this unit may be assessed through:   * 1. Observation   2. Oral questioning   3. Written test   4. Portfolio of Evidence   5. Interview   6. Third party report |
| Context of Assessment | Competency may be assessed:   * 1. Workplace   2. Simulated work environment |
| Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

# APPLIED RESEARCH

UNIT CODE: 0111 551 9A

UNIT DESCRIPTION

This unit specifies the competencies required to conduct scientific research. It involves preparing scientific research proposal, carrying out laboratory research, analyzing findings and documenting and disseminating research findings.

ELEMENTS AND PERFORMANCE CRITERIA

|  |  |
| --- | --- |
| ELEMENT  These describe the key outcomes which make up workplace function | PERFORMANCE CRITERIA  These are assessable statements which specify the required level of performance for each of the elements |
| * Prepare scientific research proposal | 1. Scientific research problem is identified based on existing research gap 2. Research objectives are developed according to research problem 3. Research questions are designed based on research objectives 4. Scientific research proposal is developed as per standard research procedures |
| * Apply scientific research methods | 1. ***Scientific study design*** is determined in accordance with research problem and research data 2. Sample size is determined based on the research methodology 3. ***Sampling techniques*** are determined in accordance with scope and research methodology 4. Ethical considerations are determined based on research methods utilized 5. Research materials are identified based on scope and research methodology 6. Data is collected in accordance with research methodology |
| * Analyse scientific research finding | 1. ***Data analysis methods*** are identified as per job requirement. 2. Data analysis is performed as per work procedure 3. Research report is prepared as per work procedure. |

RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

|  |  |
| --- | --- |
| VARIABLE | RANGE |
| * + - 1. Scientific study design includes but not limited    to: | * Qualitative designs * Quantitative designs |
| * + - 1. Sampling techniques include but not limited to: | * Probability * Non-probability |
| * + - 1. Data analytical methods include but not limited to: | * ANOVA * Measures of central tendency * Measures of dispersal |

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

Required Skills

The individual needs to demonstrate the following skills:

* Analytical
* Communication
* Computer
* Creativity
* Interpersonal
* Critical thinking
* Data collection
* Decision making
* Dissemination
* Observation
* Problem solving
* Report writing
* Statistical

Required Knowledge

The individual needs to demonstrate knowledge of:

* Introduction to research
* Problem identification
* Types of research
* Purposes of research
* Basic terms in research
* Problem identification
* Literature review
* Research design
* Data collection and analysis
* Research materials
* Statistics
* Mathematics
* Research proposal
* Research report

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |
| --- | --- |
| Critical Aspects of Competency | Assessment requires evidence that the candidate:   * 1. Identified Scientific research problem based on existing research gap   2. Developed scientific research proposal as per standard research procedures   3. Collected data in accordance with research methodology   4. Performed data analysis as per work procedure   5. Prepared Research report as per work procedure. |
| Resource Implications | The following resources should be provided:   * 1. Workstation   2. Reporting tools   3. Data collection tools   4. Stationery   5. Data analysis tools   6. PPEs |
| Methods of Assessment | Competency may be assessed through:   1. Practical Assessment 2. Project-Based Assessment 3. Portfolio of Evidence 4. Third Party Reports 5. Written Assessment |
| * + - 1. Context of Assessment | Competency may be assessed:   * 1. Workplace   2. Simulated work environment |
| * + - 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

# APPLY NATURAL RESOURCE ECONOMICS

UNIT CODE: 0521 541 10A

UNIT DESCRIPTION

This unit covers the competencies required to apply natural resource economics it involves apply economics principles, determine commodity prices, draw and interpret production function curves and Apply principles of international trade done.

ELEMENTS AND PERFORMANCE CRITERIA

|  |  |
| --- | --- |
| ELEMENT  These describe the key outcomes which make up workplace functions | PERFORMANCE CRITERIA  These are assessable statements which specify the required level of performance for each of the elements  (Bold and italicized terms are elaborated in the range) |
| 1. Apply economics principles | 1. Demand and supply is analyzed based on law of supply and demand 2. ***Sustainability principles*** are applied as per sustainable development goals 3. Resource economic data is managed based on the standard data handling procedures 4. ***Economic criteria*** for resource utilization is evaluated based on market demand 5. ***Control standards*** are applied as per standards of economics |
| 2. Determine commodity prices | 2.1 Price is determined by market forces  2.2 Property right approaches are considered based on National land policy  *2.3* ***Market challenges*** are managed based on market behavior |
| 3. Draw and interpret production function curves | 3.1 Production decisions are made based on market demand  3.2 Production relationship is identified based on input and output performance  3.3 Principles of production function are applied based on nature of enterprise |
| 4.Apply principles of international trade done | 4.1 International environmental economic policies are applied as per environmental polices: social and economic outcomes 2022  4.2 ***Economic incentives*** are applied based on Incentive based trade policy  4.3***Voluntary environmental schemes*** are applied based on trade practices |

RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

|  |  |
| --- | --- |
| Variable | Range |
| Market forces includes but not limited to: | * Government regulations * Economic growth * Technological advancement * Consumer preferences * Competition |
| Economic criteria includes but not limited to: | * Efficiency of policy * Cost effectiveness of policy * Fairness * Incentives for innovations * Enforceability of policy |
| Sustainability principles include but not limited to: | * Emission standards * Input standards * Technology standards |
| Economic incentives includes but not limited to: | * Emission taxes * Emission subsidies * Polluter pay principles * Transferable emission permits * Auctioned emission permits |
| 5. Voluntary environmental schemes include but not limited to: | * ISOs * Environmental reporting standards |
| 6. Market challenges includes but not limited to: | * Monopolies * Externalities * Asymmetric information * Public goods * Open resources |

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

Required Skills

The individual needs to demonstrate the following skills:

* Negotiation skills
* Quantitative skills
* Analytical skills
* Math and economic skills
* ICT skills
* Research skills
* Analysis skills

Required knowledge

The individual needs to demonstrate knowledge of:

* Mathematics
* Policies and regulations
* Externalities
* Profit and loss
* Cost benefit analysis
* Elasticity demand and supply
* Taxes
* Market failure
* Market and non-market goods and services
* Public goods

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

|  |  |
| --- | --- |
| 1. Critical aspects of Competency | Assessment requires evidence that the candidate:   1. Analysed demand and supply is based on law of supply and demand. 2. Applied sustainability principles as per sustainable development goals. 3. Applied principles of production function based on nature of enterprise. 4. Applied ***economic incentives*** based on Incentive based trade policy |
| 2. Resource Implications | The following resources should be provided:   1. Access to relevant workplace or appropriately simulated environment where assessment can take place 2. Materials relevant to the proposed activity or tasks |
| 3.Methods of Assessment | Competency in this unit may be assessed through:   1. Observation 2. Oral questioning 3. Written test 4. Portfolio of Evidence 5. Interview 6. Third party report |
| 4.Context of Assessment | Competency may be assessed:   * 1. Workplace   2. Simulated work environment |
| 5. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

# APPLY INORGANIC AND ORGANIC CHEMISTRY

UNIT CODE: 0531 551 11A

UNIT DESCRIPTION

This unit specifies the competencies required to apply inorganic and organic chemistry. It involves applying physical chemistry principles, inorganic and organic chemistry concepts.

ELEMENTS AND PERFORMANCE CRITERIA

|  |  |
| --- | --- |
| ELEMENT  These describe the key outcomes which make up workplace functions | PERFORMANCE CRITERIA  These are assessable statements which specify the required level of performance for each of the elements  (Bold and italicized terms are elaborated in the range) |
| * + - 1. Apply physical chemistry principles | 1. Acid and bases properties are applied as per acid-base theory. 2. Salts properties are applied as per salt solubility rules 3. Ionic and chemical equilibrium properties are applied as per physical chemistry theory. 4. Reaction kinetics properties are applied as per physical chemistry theory. 5. Gas properties are applied as per kinetic theory of gases. |
| * + - 1. Apply inorganic chemistry concepts | 1. Knowledge of element is applied as per the periodic table. 2. ***Chemical bonds*** are determined according to Valence Shell Electron Pair Repulsion (VSEPR) theory. 3. Inorganic salts are tested as per solubility rules |
| * + - 1. Apply organic chemistry concepts | 1. ***Organic compounds classes*** are used according to International Union of Pure and Applied Chemistry (IUPAC) rules. 2. ***Physical properties*** of organic compounds are applied as per IUPAC rules. 3. ***Chemical properties*** organic compounds are applied as per IUPAC rules. 4. Synthesized compounds are purified as per organic laboratory manual 5. Purified compounds are used as per organic laboratory manual |

RANGE

This section provides work environment and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

|  |  |
| --- | --- |
| Variable | Range |
| 1. Chemical bonds may include but are not limited to: | * Ionic bonds * Covalent bonds * Metallic bonds * Hydrogen bonds |
| 2. Organic compounds classes may include but are not limited to: | * Carbohydrates * Proteins * Lipids * Hydrocarbons |
| 3.Physical properties may include but are not limited to: | * Colour * Hardness * Mass * Solubility * Density * Melting point |
| 4.Chemical properties may include but are not limited to: | * pH * Chemical stability * Radioactivity * Flammability * Heat of combustion |

REQUIRED KNOWLEDGE AND SKILLS

This section describes the knowledge and skills required for this unit of competency.

Required knowledge

The individual needs to demonstrate knowledge of:

* Periodic table
* Hydrocarbons
* Chemical reaction
* Laboratory safety
* Laboratory apparatus
* Laboratory rules and regulation

Required skills

The individual needs to demonstrate the following skills:

* Observation
* Analytical
* Critical thinking
* Writing
* Active listening
* Problem solving

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required knowledge and skills range.

|  |  |
| --- | --- |
| * 1. Critical aspects of competency | Assessment requires evidence that the candidate:   1. Applied acid and bases properties as per acid-base theory. 2. Applied salts properties as per salt solubility rules 3. Applied Ionic and chemical equilibrium properties as per physical chemistry theory. 4. Applied reaction kinetics properties as per physical chemistry theory. 5. Applied gas properties as per kinetic theory of gases. 6. Tested inorganic salts as per solubility rules 7. Applied physical properties of organic compounds as per IUPAC rules. 8. Applied chemical properties organic compounds as per IUPAC rules. 9. Used purified compounds as per organic laboratory manual |
| * 1. Resource implications | The following resources should be provided:   * 1. Appropriately simulated environment where assessment can take place   2. Access to relevant work environment   3. Resources relevant to the proposed activities or tasks |
| * 1. Methods of assessment | Competency in this unit may be assessed through:   * 1. Observation   2. Oral questioning   3. Portfolio of evidence   4. Third party report   5. Written tests |
| * 1. Context of assessment | Competency may be assessed:   * 1. Workplace   2. Simulated work environment |
| * 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector and workplace job role is recommended. |

# APPLY BIOCHEMISTRY PRINCIPLES

UNIT CODE: 0512 551 12A

UNIT DESCRIPTION

This unit specifies the competencies required to apply biochemistry principles. It involves measuring Enzyme kinetics, analyzing carbohydrates, proteins, lipids, vitamins and minerals.

ELEMENTS AND PERFORMANCE CRITERIA

|  |  |
| --- | --- |
| ELEMENT  These describe the key outcomes which make up workplace functions | PERFORMANCE CRITERIA  These are assessable statements which specify the required level of performance for each of the elements  (Bold and italicized terms are elaborated in the range) |
| * + 1. Measure Enzyme kinetics | * 1. Enzyme and substrate are prepared as per laboratory procedures.   2. Enzyme assay are set up as per laboratory procedures.   3. Enzyme reaction rate are measured as per laboratory procedures. |
| * + 1. Analyze carbohydrates | 1. Carbohydrates are identified based on chemical composition as per laboratory procedure. 2. ***Carbohydrates are classified***based on chemical composition as per laboratory procedure. 3. Carbohydrates are classified based on chemical structure. 4. ***Carbohydrate*** functions are applied based on chemical structure. |
| * + 1. Analyze proteins | 1. Proteins are identified based on chemical composition as per laboratory procedure. 2. Proteins classify based on chemical structure. 3. Proteins functions are applied based on chemical structure. |
| * + 1. Analyze lipids | 1. ***Lipids*** are identified based on chemical composition as per laboratory procedure. 2. Lipids classified based on chemical structure. 3. Lipids functions are applied based on functional groups. |
| * + 1. Analyze Minerals and vitamins | 1. Minerals and vitamins are identified based on chemical composition as per laboratory procedure. 2. ***Minerals***functions areapplied based on chemical structure. 3. ***Vitamins***functions are appliedbased on chemical structure. |

RANGE

This section provides work environment and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

|  |  |
| --- | --- |
| Variable | Range |
| 1. Carbohydrates are classified may include but are not limited to: | * Monosaccharide’s * Disaccharides * Polysaccharides * Oligosaccharides |
| 1. Fats and lipids classified may include but are not limited to | * Phospholipids * Triglycerides * Sphingolipids * Steroids |
| 1. Minerals are classified may include but are not limited to | * Macro elements * Micro elements |
| 1. Vitamins classified may include but are not limited to | * Water soluble vitamins * Fat soluble vitamins |

REQUIRED KNOWLEDGE AND SKILLS

This section describes the knowledge and skills required for this unit of competency.

Required knowledge

The individual needs to demonstrate knowledge of:

* Hydrocarbons
* Chemical reaction
* Laboratory safety
* Laboratory apparatus
* Laboratory rules and regulation
* Basic cell biology

Required skills

The individual needs to demonstrate the following skills:

* Observation
* Analytical
* Critical thinking
* Writing
* Active listening
* Problem solving
* Numeracy
* Communication

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required knowledge and skills range.

|  |  |
| --- | --- |
| * 1. Critical aspects of competency | Assessment requires evidence that the candidate:   * 1. Measured enzyme reaction rate as per laboratory procedures.   2. Applied carbohydrate functions based on chemical structure.   3. Applied proteins functions based on chemical structure.   4. Applied lipids functions based on functional groups.   5. Applied minerals functions based on chemical structure.   6. Applied vitamins functions based on chemical structure. |
| * 1. Resource implications | The following resources should be provided:   1. Appropriately simulated environment where assessment can take place 2. Access to relevant work environment 3. Resources relevant to the proposed activities or tasks |
| * 1. Methods of assessment | Competency in this unit may be assessed through:   1. Observation 2. Oral questioning 3. Portfolio of evidence 4. Interviews 5. Third party report 6. Written tests |
| * 1. Context of assessment | Competency may be assessed:   * 1. Workplace   2. Simulated work environment |
| * 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector and workplace job role is recommended. |

# 

# CORE UNITS

# MANAGE ENVIRONMENTAL POLLUTION

UNIT CODE: 0521 551 13A

UNIT DESCRIPTION

This unit covers the competencies required to manage environmental pollution. It involves controlling air pollution, controlling water pollution, controlling soil pollution, controlling noise pollution and conducting environmental pollution awareness.

ELEMENTS AND PERFORMANCE CRITERIA

|  |  |
| --- | --- |
| ELEMENT  These describe the key outcomes which make up workplace functions | PERFORMANCE CRITERIA  These are assessable statements which specify the required level of performance for each of the elements  (Bold and italicized terms are elaborated in the range) |
| 1. Control environmental air pollution | 1. ***Air pollution sources*** are identified based are Environmental management and coordination act (EMCA )2014(1999) 2. human health effects are analysed based on nature of the air pollutants 3. Neighbouring sensitive receptorsare identified based on biodiversity report 4. Air Quality Impact Assessment reports are compiled as per (EMCA )2014(1999) 5. ***Air pollution control measures*** are implemented as per EMCA 2014 |
| 2. Control environmental water pollution | 2.1 Point and Non-point pollution sources are identified as per EMCA, 2015  2.2 ***Water quality indicators*** are determined based on EMCA (water quality ) regulations 2006  2.3 Neighboring sensitive receptors identified as per EMCA (water quality ) regulations  2.4 Polluted water is treated based on EMCA (water quality ) regulations 2006 |
| 3. Control environmental soil pollution | 3.1 Soil sample is collected as per laboratory procedures  3.2. Soil testing method is identified as per EMCA (soil quality standards ) regulations 2007  3.3. Soil is analyzed as per EMCA (soil quality standards )regulations 2007  3.4. Results are interpreted and report compiled according to workplace procedures  3.5 ***Soil pollution control*** is carried out as per EMCA (soil quality standards )regulations 2007 |
| 4. Control environmental noise pollution | 4.1 Noise pollution sources are identified based on EMCA (noise pollution and excessive vibration)regulations 2009  4.2***Noise pollution levels***aredetermined based EMCA (noise pollution and excessive vibration) regulations 2009  4.3***Noise pollution control***is implemented as per EMCA (noise pollution and excessive vibration) regulations 2009 |
| 5.Conduct environmental pollution awareness | 5.1 Pollution sources are identified as per EMCA 1999  5.2 Awareness creation channelsidentified  5.3 community sensitization programs are established per article 42 ,69 and 70 of the constitution of Kenya 2010 |

RANGE

This section provides a work environment and conditions to which the performance criteria apply. It allows for a different work environment and situations that will affect performance.

|  |  |
| --- | --- |
| Variable | Range |
| * + 1. Sources of air pollution includes but not limited to: | * Industrial * Anthropogenic |
| * + 1. Sources of water pollution includes but not limited to: | * Point source * Non-point source. * Oil spills |
| * + 1. Sources of soil pollution includes but not limited to: | * Fertilizers * Pesticides * Solid wastes * Overgrazing * Oil * Acid rain |
| * + 1. Air pollution control measures includes but not limited to | * Green energy technologies * Solar * Wind * Geothermal * Carbon sinks * Environmental plans and regulations |
| * + 1. Water pollution control measures includes but not limited to: | * Water quality permits * Soil erosion control * Biological pest control techniques * Waste water treatment * Regulation of effluents |
| * 1. Water quality indicators include but not limited to: | * Chemical * Physical * Biological * Microbiological |
| * 1. Soil pollution control measures includes but not limited to: | * Use of organic fertilizers and eco-friendly pesticides * Reforestation * Solid wastes management * Soil erosion control |
| * 1. Treated includes but not limited to: | * Extraction and separation techniques * Thermal methods * Chemical methods * Microbial treatment methods |
| * 1. Sources of noise pollution includes but not limited to: | * Night clubs * Industries * Vehicles |
| * 1. Noise pollution control measures includes but not limited to: | * Noise permits * Ear muffs are used in high noise areas * Industries are constructed away from residential areas |

REQUIRED KNOWLEDGE AND SKILLS

This section describes the knowledge and skills required for this unit of competency.

Required knowledge

The individual needs to demonstrate knowledge of:

* Types of pollutants
* Sources of pollution
* Permits
* Methods of pollution control
* Environmental laws, policies and regulations
* Pollution monitoring and evaluation tools
* Environmental degradation and pollution
* Safety precautions
* Sustainable development goals
* Required skills

The individual needs to demonstrate the following skills:

* Monitoring and evaluation
* Research
* Analytical skills
* Measuring skills
* Report writing
* Problem solving skills
* Sorting/Segregation wastes

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required knowledge and skills range.

|  |  |
| --- | --- |
| * + 1. Critical aspects of Competency | Assessment requires evidence that the candidate:   * 1. Identified *Air pollution sources* based Environmental management and coordination act (EMCA )2014(1999)   2. Identified Point and non-point pollution sources as per EMCA 2015   3. Determined *water quality indicators* based on EMCA (water quality )regulations 2006   4. Collected soil sample as per laboratory procedures   5. Identified noise pollution sources based on EMCA (noise pollution and excessive vibration)regulations 2009   6. Determined *noise pollution levels*  based EMCA (noise pollution and excessive vibration)regulations 2009   7. Identified awareness creation channels as per work procedures |
| * + 1. Resource Implications | The following resources should be provided:   * 1. Access to relevant workplace or appropriately   2. simulated environment where assessment can take place   3. Materials relevant to the proposed activity or tasks |
| * + 1. Methods of assessment | Competency in this unit may be assessed through:   * 1. Oral questioning   2. Portfolio of evidence   3. Interviews   4. Third party report   5. Written tests |
| * + 1. Context of Assessment | Competency may be assessed:   * 1. Workplace   2. Simulated work environment |
| * + 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended |

# MANAGE ENVIRONMENTAL WASTE

UNIT CODE: 0521 551 14A

UNIT DESCRIPTION

This unit covers the competencies required to manage environmental waste it involves conducting integrated solid waste management, managing environmental hazardous waste, managing electronic waste, managing liquid waste and conducting environmental waste management awareness.

ELEMENTS AND PERFORMANCE CRITERIA

|  |  |
| --- | --- |
| ELEMENT  These describe the key outcomes which make up workplace functions | PERFORMANCE CRITERIA  These are assessable statements which specify the required level of performance for each of the elements  (Bold and italicized terms are elaborated in the range) |
| 1. Conduct integrated solid waste management | 1.1 Solid waste ***sources***identified as per Sustainable waste management Act 2022  1.2 Solid waste ***storage facilities are***coded Sustainable waste management Act 2022  1.3 Solid waste is segregated and reduced as per Sustainable waste management Act 2022  1.5 solid waste is transported in line with Sustainable waste management Act 2022  1.6 solid waste***sources***identified as per Sustainable waste management Act 2022 |
| 2. Manage environmental electronic waste | 1. ***Electronic (E)waste*** sources are identified as per EMCA 1999 2. Electronic wastesreduced and segregated at source in line with EMCA (Waste management) Regulation, 2006 3. Electronic wastes transported *in* line with EMCA (Waste management) Regulation, 2006 4. Electronic wastes *reused* and recycledas per Sustainable waste management Act 2022 5. Electronic wastes disposedsafely in line with Sustainable waste management Act 2022 |
| 3.Manage environmental liquid waste | 1. *Liquid waste sources are* identified as per EMCA (water quality) regulations 2006 2. *Liquid waste* is transported *as* per EMCA (water quality) regulations 2006 3. Liquid waste is  *treated* *and disposed* as per EMCA (water quality) regulations 2006 |
| 4. Conduct environmental waste management awareness | 4.1 Awareness creation channels are *identified* as per stakeholder Engagement Framework of 2020  4.2 community sensitization programs are established per article 42 ,69 and 70 of the constitution of Kenya 2010  4.3 Community Sensitized based on the program  Report prepared based on sensitization program |

RANGE

This section provides work environment and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

|  |  |
| --- | --- |
| Variable | Range |
| * + 1. Solid wastes include but not limited to: | * + Biodegradable   Non-biodegradable |
| 2. Hazardous wastes include but not limited to: | * Asbestos * Paints * Automotive wastes * Pesticides * Mercury * Electronics * Radioactive materials * Medical waste |
| 3.Electronic wastes include but not limited to: | * Electrical appliances * Microchips * Phones |
| 4.Disposed includes but not limited to: | * Incinerated * Pyrolysis * Landfill * Recycling |
| 5.Sources includes but not limited to: | * Industrial * Agricultural * Municipal * residential |

REQUIRED KNOWLEDGE AND SKILLS

This section describes the knowledge and skills required for this unit of competency.

Required knowledge

The individual needs to demonstrate knowledge of:

* Types of wastes
* Technological knowhow
* Waste inventory
* Wastewater treatment
* Hazardous wastes
* Policy regulations (EMCA,1999)
* Landfills
* Sludge management
* 7Rs

Required skills

The individual needs to demonstrate the following skills:

* Monitoring and evaluation
* Research
* Analytical skills
* Measuring skills
* Report writing
* Problem solving skills
* Sorting/Segregation wastes
* Recovering wastes
* Recycling wastes

NB: Required knowledge and skills are obtained from the Occupational Profile Chart (DACUM Chart)

**EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required knowledge and skills range.

|  |  |
| --- | --- |
| * + - 1. Critical aspects of competency | Assessment requires evidence that the candidate:   * 1. Identified solid waste sources as per Sustainable waste management Act 2022   2. Identified solid waste sources as per Sustainable waste management Act 2022   3. Identified electronic (E)waste sources as per EMCA 1999   4. Identified liquid waste sources as per EMCA (water quality) regulations 2006   5. Identified awareness creation channelsas per stakeholder Engagement Framework of 2020 |
| * + - 1. Resource implications | The following resources should be provided:   * 1. Access to relevant workplace or appropriately simulated environment where assessment can take place   2. Materials relevant to the proposed activity or tasks |
| * + - 1. Methods of assessment | Competency in this unit may be assessed through:   * 1. Observation   2. Oral questioning   3. Written test   4. Portfolio of Evidence   5. Interview   6. Third party report |
| * + - 1. Context of assessment | Competency may be assessed:   * 1. Workplace   2. Simulated work environment |
| * + - 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector and workplace job role is recommended. |

# PERFORM ENVIRONMENTAL SAFEGUARDS AND COMPLIANCE

UNIT CODE: 0521B551 15A

UNIT DESCRIPTION

This unit covers the competencies required to perform environmental safeguards and compliance. It involves conducting Environmental and Social Impact Assessment, conducting Environmental audit, conducting strategic Environmental Assessment and monitoring safety compliance.

ELEMENTS AND PERFORMANCE CRITERIA

|  |  |
| --- | --- |
| ELEMENT  These describe the key outcomes which make up workplace functions | PERFORMANCE CRITERIA  These are assessable statements which specify the required level of performance for each of the elements  (Bold and italicized terms are elaborated in the range) |
| 1. Conduct Environmental and social Impact Assessment | 1.1 ***Terms of Reference*** *(TOR*) is developed as per proposed project details 2019 NEMA review guidelines.  1.2***Data collection tools***are developed in line with 2019 NEMA review guidelines.  1.3 ***Public participation*** is conducted as per 2019 NEMA review guidelines  1.4 ***Baseline study*** is carried out in line with 2019 NEMA review guidelines  1.5 Data analysis is carried out as per  1.6 Environmental and social management plan (ESMP)is prepared as per 2019 NEMA review guidelines  1.7 Environmental and social monitoring plan (ESMP)is prepared as per 2019 NEMA review guidelines  1.8 Environmental action plan is prepared as per 2019 NEMA review guidelines  1.9Environmental and social impact assessment (ESIA) report is prepared as per 2019 NEMA review guidelines  2.0 ESIA report is submitted as per 2019 NEMA review guidelines |
| 2. Conduct Environmental Audit | 2.1 ***Data collection tools***are developed in line with 2019 NEMA review guidelines.  2.3 ***Stakeholders engagement***is carried out as per 2019 NEMA review guidelines  2.4 baseline study is carried out in line with 2019 NEMA review guidelines  2.5 data analysis is carried out as per  2.6 Environmental and social management plan (ESMP)is updated as per 2019 NEMA review guidelines  2.7 Environmental and social monitoring plan (ESMP)is updated as per 2019 NEMA review guidelines  2.8 Environmental action plan is updated as per 2019 NEMA review guidelines  2.9 audit report is submitted as per 2019 NEMA review guidelines |
| 3. Conduct Strategic environmental assessment | 3.0 Objectives are formulated as per 2012 sea guidelines  3.1 screening and scoping of the sea as per 2012 sea guidelines  3.2 data collection tools are prepared as per 2012 sea guidelines  3.3 public participation conducted as per 2012 sea guidelines  3.4 baseline study is carried out in line with 2012 sea guidelines  3.5 data analysis is carried out as per national commission science technology and innovation (NACOSTI)2019  3.6 environmental and social management plan (esp.)is prepared as per 2012 national guidelines  3.7 environmental and social monitoring plan (ESMP)is prepared as per 2012 national guidelines  3.8 sea report is prepared as per 2012 national guidelines  3.9 sea report is submitted as per 2012 national guidelines |
| 4. Monitor environmental safety compliance | 4.1 Air pollution controlled as per EMCA(air quality) regulation, 2014  4.2 Water pollution controlled as per EMCA (water quality) regulation, 2006  4.3Environmental noise pollution controlled as per EMCA(noise and excessive vibration) regulation, 2009  4.4Soil pollution controlled as per EMCA cap 387  4.5 Energy consumption is regulated as per Energy Petroleum Regulatory Authority (EPRA) act 2019. |

RANGE

This section provides work environment and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

|  |  |
| --- | --- |
| Variable | Range |
| 1. Identified includes but not limited to: | * + Type of projects   + Its size   + Components   + Processes expected   + All stages of implementation |
| 1. Terms of reference includes but not limited to: | * Policy framework * Institutional framework * Legal framework * Mitigation measures * Project alternative analysis |
| 1. Data collection tools includes but not limited to: | * Desk Review * Field study |
| 1. Implemented includes but not limited to: | * Scoping * SEA study |
| 1. Public participation includes but not limited to | * Questionnaires * Checklists * Open minded questions * Baraza’s |
| 1. Stakeholder includes but not limited to: | * Government * Project proponent * EIA expert * Public * Donors * Private sector |

REQUIRED KNOWLEDGE AND SKILLS

This section describes the knowledge and skills required for this unit of competency.

Required knowledge

The individual needs to demonstrate knowledge of:

* Environmental impact assessment guidelines
* Mitigation measures
* Project management
* Audit and review
* Environmental resources
* Environmental policies and laws
* Relevant government authorities

Required skills

The individual needs to demonstrate the following skills:

* Monitoring and evaluation
* Report writing
* Auditing and reviewing
* Sampling
* Budgeting
* Record keeping
* Research skills
* Planning and organizing
* Leadership skills
* Management skills
* analytical skills
* Interpersonal skills

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required knowledge and skills range.

|  |  |  |  |
| --- | --- | --- | --- |
| * + - 1. Critical aspects of Competency | Assessment requires evidence that the candidate:   * 1. Performed Environmental Impact Assessment as per 2019 NEMA review guidelines   2. Prepared EIA Report as per 2019 NEMA review guidelines   3. Prepared an environmental and social management plan as per 2019 NEMA review guidelines   4. Performed a Strategic environmental assessment as per 2019 NEMA review guidelines   5. Performed Environmental Audit as per 2019 NEMA review guidelines   6. Applied legal framework and policies as per 2019 NEMA review guidelines |  |  |
| * + - 1. Resource Implications | The following resources should be provided:   * 1. Access to relevant workplace or appropriately simulated environment where assessment can take place   2. Materials relevant to the proposed activity or tasks |  |  |
| * + - 1. Methods of Assessment | Competency in this unit may be assessed through:   * 1. Observation   2. Oral questioning   3. Written test   4. Portfolio of Evidence   5. Interview   6. Third party report |  |  |
| * + - 1. Context of Assessment | Competency may be assessed:   * 1. Workplace   2. Simulated work environment |  |  |
| * + - 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |  |  |

**PERFORM ENVIRONMENTAL PLANNING AND MANAGEMENT**

UNIT CODE: 0521 551 16A

UNIT DESCRIPTION

This unit covers the competencies required to perform environmental planning and management. It involves planning environmental resources, conducting forestry management, conducting wetland and aquatic ecosystems and conducting environmental management of ASALS ecosystems.

ELEMENTS AND PERFORMANCE CRITERIA

|  |  |
| --- | --- |
| ELEMENT  These describe the key outcomes which make up workplace functions | PERFORMANCE CRITERIA  These are assessable statements which specify the required level of performance for each of the elements  (Bold and italicized terms are elaborated in the range) |
| Plan environmental resources | 1. Environmental resource scope is determined as per EMCA cap 387 2. Data collection tools are assembled as per work requirement 3. Environmental resource mapping is carried outin line with the EMCA cap. 387 4. Stakeholder’s engagement is carried out as per EMCA cap. 387 5. Environmental baseline assessment is carried out as per EMCA cap. 387 6. Environmental resource data is analyzed as per NACOSTI 2019 7. Environmental resource implementation and monitoring action plans are developed as per EMCA cap. 387 8. Environmental logical framework is developed as per EMCA cap. 387    1. environmental investment plan is developed as per EMCA cap.387 9. Environmental resource management action plan is compiled as per EMCA cap. 387 |
| Conduct forestry and management | 2.1 Data collection tools are prepared as per forest act 2016  *2.2* ***Forest management indicators*** are determined as per Forest Act 2005  2.3 forest inventory is undertaken as per forest Act 2016  2.4 Forest ecosystems assessment is performed in line with Forest Act 2016  2.5 Environmental risk analysis is performed as per Forest Act 2016  2.6 data analyzed as per NACOSTI 2019  2.7 Forests protection plan is developed based on Forest Act 2016  2.8 forest management report is compiled as per forest act 2016  2.9 forest report is submitted as per forest act 2016 |
| Conduct environmental wetland and aquatic ecosystems management | 3.1 ***Scoping*** is done as per National Lands Commission Act 2012  3.2 ***Sustainable wetland management indicators*** are determined based on EMCA wetland Regulation 2009  3.3 ***Risk analysis*** is performed based on EMCA wetland, Regulation 2009  3.4 ***Wetland ecosystems*** assessment is performed based on EMC wetland Regulation 2009  3.5 Wetlands protection plan is developed based on EMC (wetland, riverbanks, lakeshores, and seashores management) Regulation 2009  3.6 Environmental ***scoping***  undertaken as per National Lands Commission Act 2012  3.7 Sustainable aquatic management indicatorsdetermined as per Water Act 2016  3.8 Aquatic ecosystems risks assessment performed as per Water Act 2016  3.9 Aquatic ecosystems management plan developed based on Water Act 2016 |
| Conduct environmental management of ASALs ecosystems | 4.1 ***ASALs*** resources are identified  *4.2* ***Sustainable practices*** are applied based on the type ASALs.  4.3 Government policies are applied |

RANGE

This section provides work environment and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

|  |  |
| --- | --- |
| Variable | Range |
| Scoping includes but not limited to: | * 1. Legal review   2. Case studies review   3. Alternative   4. Stakeholder |
| Risk analysis includes but not limited to: | 1. Hazard identification 2. Exposure assessment 3. Effect evaluation 4. Risk estimation 5. Risk management 6. Monitoring and review |
| Forest Indicators includes but not limited to: | 1. Tree species 2. Tree age structure 3. Forest regeneration 4. Carbon sequestration 5. Number of species 6. Forest cover |
| Sustainable practices includes but not limited to | 1. 3RSs 2. Water conservation 3. Energy efficiency 4. Sustainable Agriculture 5. Renewable energy 6. Green transportation 7. Community engagement |
| ASALS includes but not limited to | 1. Deserts 2. Semi-arid grasslands 3. Arid scrublands 4. Coastal deserts 5. Semi-arid deserts |
| * + - 1. Aquatic ecosystems includes but not limited to: | 1. Rivers 2. seas 3. Lakes 4. Mangrove forests 5. Intertidal zones 6. Coral reefs 7. Oceans 8. Wetlands 9. Swamps |

REQUIRED KNOWLEDGE AND SKILLS

This section describes the knowledge and skills required for this unit of competency.

Required knowledge

The individual needs to demonstrate knowledge of:

* Plant and animal adaptations in ASALs
* Zoning
* Sustainable resource practices
* Project planning and management
* Agricultural production
* Forest estates
* Land use change
* Mangrove
* Wetlands
* Marine protected areas

Required skills

The individual needs to demonstrate the following skills:

* Sampling
* Survey skills
* Conflict resolution
* Resource mobilization skills
* Communication skills
* ICT skills
* Research skills
* Planning, organizing and co-ordination skills
* Monitoring and evaluation
* Leadership skills
* Report writing
* Excellent analytical skills

Interpersonal skills

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required knowledge and skills range.

|  |  |
| --- | --- |
| * + - 1. Critical aspects of competency | Assessment requires evidence that the candidate:   * 1. Determined environmental resource scope as per EMCA cap 387   2. Determined *forest management indicators* as per Forest Act 2005   3. Indicators sustainable aquatic management determined as per Water Act 2016   4. Identified *ASALs* resources as per work procedures   5. Applied *sustainable practices* based on the type ASALs. |
| * + - 1. Resource implications | The following resources should be provided:   * 1. Access to relevant workplace or appropriately simulated environment where assessment can take place   2. Materials relevant to the proposed activity or tasks |
| * + - 1. Methods of assessment | Competency in this unit may be assessed through:   * 1. Observation   2. Oral questioning   3. Written test   4. Portfolio of Evidence   5. Interview   6. Third party report |
| * + - 1. Context of assessment | Competency may be assessed:   * 1. Workplace   2. Simulated work environment |
| * + - 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector and workplace job role is recommended. |

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# CARRY OUT ECO TOXICOLOGY

UNIT CODE: 0521 551 17A

UNIT DESCRIPTION

This unit covers the competencies required to carry out eco toxicology. It involves conducting soil quality , conducting water quality and monitor soil and water quality.

ELEMENTS AND PERFORMANCE CRITERIA

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| --- | --- |
| ELEMENT  These describe the key outcomes which make up workplace functions | PERFORMANCE CRITERIA  These are assessable statements which specify the required level of performance for each of the elements  (Bold and italicized terms are elaborated in the range) |
| 1. Conduct soil quality | 1.1***Source of toxicant*** is identified as per EMCA cap 387  1.2 Soil samples are collected as per KEPHIS ACT 2012  1.3 **Soil *Sample parameters*** tested and analyzed as per KEPHIS ACT 2012  1.4Levels of exposure assessed as per ISO 28258  1.5 Report prepared based on laboratory analysis |
| 2. Conduct water quality | 2.1***Source of toxicant*** is identified as per EMCA (Water Quality) Regulation, 2006  2.2 Water samples are collected based on EMCA (Water Quality) Regulation, 2006  2.3 Sample ***parameters*** tested and analyzed EMCA (Water Quality) Regulation, 2006  2.4 Levels of exposure assessed EMCA (Water Quality) Regulation, 2006  2.5 Report prepared based on laboratory analysis |
| 3. Monitor soil and water quality | 3.1 Site of sensor receptors are identified as per the area affected  3.2 Install sensor devices as per the area affected  3.3 Monitoring action plan developed |

RANGE

This section provides work environment and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

|  |  |
| --- | --- |
| Variable | Range |
| 1.Sources of toxicant may include but are not limited to: | * Industries * Agriculture * Mining * Landfill and waste sites * Sewage and waste water * Atmospheric deposition * Oil spill * Urban run off |
| 2. Water quality parameters may include but are not limited to: | * Dissolved oxygen * Temperature * Nutrients * Conductivity * Heavy metals * Biochemical oxygen demand |
| 3.Soil quality parameters may include but are not limited to: | * Organic matter content * Nutrient levels * Soil moisture * Compaction * Soil microorganisms * Soil biodiversity |

REQUIRED KNOWLEDGE AND SKILLS

This section describes the knowledge and skills required for this unit of competency.

Required knowledge

* Technologies
* Sustainable development
* Causes, impact and adaptation of climate change
* Local and International policies on climate change
* Indigenous knowledge of regions
* Emerging issues
* Integration of scientific perspectives

Required skills

The individual needs to demonstrate the following skills:

* Monitoring and evaluation
* Creative and innovative
* ICT skills
* Problem solving skills
* Assessing skills
* Observation skills
* Resource mobilization
* Research skills
* Interpretation skills

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required knowledge and skills range.

|  |  |
| --- | --- |
| * + - 1. Critical aspects of competency | Assessment requires evidence that the candidate:   * 1. Identified Source of toxicant as per EMCA cap 387   2. Identified source of toxicant as per EMCA (Water Quality) Regulation, 2006   3. Site of sensor receptors are identified as per the area affected |
| * + - 1. Resource implications | The following resources should be provided:   * 1. Access to relevant workplace or appropriately simulated environment where assessment can take place   2. Materials relevant to the proposed activity or tasks |
| * + - 1. Methods of assessment | Competency in this unit may be assessed through:   * 1. Observation   2. Oral questioning   3. Written test   4. Portfolio of Evidence   5. Interview   6. Third party report |
| * + - 1. Context of assessment | Competency may be assessed:   * 1. Workplace   2. Simulated work environment |
| * + - 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector and workplace job role is recommended. |

# MANAGE CLIMATE CHANGE IMPACT

UNIT CODE: 0521 551 18A

UNIT DESCRIPTION

This unit covers the competencies required to conduct climate impact assessment. It involves managing greenhouse gases ,managing environmental weather data ,carrying out climate change risk assessment and carrying out climate smart adaptation and mitigation actions.

ELEMENTS AND PERFORMANCE CRITERIA

|  |  |
| --- | --- |
| ELEMENT  These describe the key outcomes which make up workplace functions | PERFORMANCE CRITERIA  These are assessable statements which specify the required level of performance for each of the elements  (Bold and italicized terms are elaborated in the range) |
| 1. Manage environmental greenhouse gases | 1. *Greenhouse gase*s sources mapped as per climate change act 2023 2. *GHG sinks* program is developed as per climate change act 2023 3. GHG reduction implementation plan is designed as per climate change act 2022 |
| 2. Manage environmental weather data | 1. ***Weather data*** collection site is mapped as per national framework for climate service 2023 2. ***Weather instruments*** is installed as per national framework for climate 3. ***Weather trends*** is recorded as per national framework for climate service 2023 4. Weather data analyzed national framework for climate service 2023 5. Weather data report prepared based on data collected |
| 3. Carry out climate change risk assessment | 1. Data collection tool is developed as per strategic Climate change response 2010 2. ***Climate risks*** data is analyzed as Climate change response 2010 3. Climate vulnerability is assessed as per Climate change response 2010 4. Climate risk implementation plan is developed as per Climate change response 2010 5. Climate risk report is prepared based on data collected |
| 4. Conduct climate change awareness | 4.1 ***Climate change hazards*** is identified based on national strategic Climate change response 2010  4.2 Climate sensitive sectors is mapped based on national strategic Climate change response 2010  4.3 ***Sector specific Priority***actions are implemented based on national strategic Climate change response 2010  4.4 ***Climate change mitigation*** report is compiled as per Determined Contribution 2020  4.5 Climate change mitigation report is compiled as per Determined Contribution 2020 |

RANGE

This section provides work environment and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

|  |  |
| --- | --- |
| Variable | Range |
| 1.Greenhouse gases may include but are not limited to: | * Carbon dioxide * Methane * Nitrous oxide * Fluorinated gases * Water vapour |
| 2. Greenhouse sinks may include but are not limited to: | * Forest and vegetation * Oceans * Wetlands * Soil * Geological formations |
| 3.Weather trends may include but are not limited to: | * Temperature * Precipitation * Wind patterns * Ocean currents * Air pressure systems * Humidity |
| 4.Climate adaptation may include but are not limited to: | * Climate smart agriculture * Climate proofing infrastructure * Livelihood diversification * Disaster preparedness * Early warning systems * Nature based solutions |
| Sector specific priority actions may include but are not limited to: | * Food security * Water * Environment * Forestry and wildlife * Housing and infrastructure * Transport * Energy sector * Health |
| 5.Climate risks may include but are not limited to: | * Extreme weather events * Rising temperatures * Sea levels rise * Excessive moisture * Moisture stress * Melting of glaciers |
| 6.Weather data may include but are not limited to | * Temperature * Precipitation * Wind * Humidity * Air pressure |
| 7.Weather instruments may include but are not limited to: | * Thermometer * Barometer * Hygrometer * Anemometer * Rain gauge * Weather vane |
| 8.Climate change hazards may include but are not limited to | * Tornadoes * Droughts, prolonged dry spell * Storms * Flooding * Increased incidences of vector ,pests and diseases |
| 9.Climate change mitigation may include but are not limited to: | * Carbon pricing * Afforestation and reforestation * Waste management * Green transportation * Education and awareness * Sustainable agriculture * green /clean energy |

REQUIRED KNOWLEDGE AND SKILLS

This section describes the knowledge and skills required for this unit of competency.

Required Skills

The individual needs to demonstrate the following skills:

* Monitoring and evaluation
* Creative and innovative
* ICT skills
* Problem solving skills
* Assessing skills
* Observation skills
* Resource mobilization
* Research skills
* Interpretation skills

Required knowledge

The individual needs to demonstrate knowledge of:

* Technologies
* Sustainable development
* Causes, impact and adaptation of climate change
* Local and International policies on climate change
* Indigenous knowledge of regions
* Emerging issues
* Integration of scientific perspectives

|  |  |
| --- | --- |
| * + - 1. Critical aspects of competency | Assessment requires evidence that the candidate:   * 1. Mapped greenhouse gases sources as per climate change act 2023   2. Identified climate change hazards based on national strategic Climate change response 2010   3. Climate change mitigation report is compiled as per Determined Contribution 2020 |
| * + - 1. Resource implications | The following resources should be provided:   * 1. Access to relevant workplace or appropriately simulated environment where assessment can take place   2. Materials relevant to the proposed activity or tasks |
| * + - 1. Methods of assessment | Competency in this unit may be assessed through:   * 1. Observation   2. Oral questioning   3. Written test   4. Portfolio of Evidence   5. Interview   6. Third party report |
| * + - 1. Context of assessment | Competency may be assessed:   * 1. Workplace   2. Simulated work environment |
| * + - 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector and workplace job role is recommended. |