



Technical and Vocational Education and Training (TVET) Council



Occupational Standards of Competence

Robotics

Level 1

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ACKNOWLEDGEMENTS

The Technical and Vocational Education and Training Council thanks the following for their contribution to the development of this document.

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Qualification Overview

NVQB

in

Robotics

Level 1

Qualification Overview

This qualification is designed to provide training, assessment and certification for persons within the robotics industry. The robotics industry is a rapidly growing sector showing economic growth and contribution to overall workforce development. Training institutions and employers can use this qualification to support trainees and employees in developing their knowledge and skills in the field of robotics.

Candidates at this level must demonstrate the required skills, knowledge and attitudes to use and maintain robotics systems to achieve simple tasks and be able to:

- operate robots with peripherals such as controllers
- investigate, diagnose and resolve unexpected maintenance problems (such as electrical and mechanical faults)
- programme robots using simple block-based coding
- contribute to design and iterative processes

Like all NVQs this qualification is competence based. This means that it is linked to the candidate's ability to competently perform a range of tasks connected with their work. Candidates must plan a programme of development and assessment with their assessors and compile a portfolio of evidence to prove that they are competent in their work role.

Who is this qualification for?

The NVQB in Robotics Level 1 is aimed at entry-level robotics technicians who work with flexible automation and may help design, build, programme, test, operate and maintain robotics systems.

Jobs within the occupational area:

Entry-level Robotics Technician

Where can it be used?

This qualification can be used in the health care, manufacturing, engineering and service industries where persons are required to build, programme, test, operate and maintain robotics systems.

A011401 - APPROVED NATIONAL VOCATIONAL QUALIFICATION STRUCTURE

ROBOTICS LEVEL 1

To achieve a full award, candidates must complete all ten (10) mandatory units.

<u>Mandatory Units (All must be completed)</u>	<u>CODES</u>
1. Manage personal and professional development	UA49301
1.1 Organise work	
1.2 Direct own learning	
1.3 Review performance	
2. Maintain codes of conduct and safety procedures in the workspace	UA49401
2.1 Confirm procedures to be maintained	
2.2 Coordinate safe work practices	
2.3 Improve performance	
2.4 Complete work activities	
3. Collaborate with others	UA49501
3.1 Communicate with individuals from diverse backgrounds	
3.2 Deal with cultural misunderstandings	
3.3 Work with others	
4. Participate in researching new robotics technologies	UA49601
4.1 Research new trends and technologies	
4.2 Incorporate new trends and technologies	
4.3 Monitor the performance of incorporated new trends and technologies	
5. Identify and apply robots and robotics systems	UA49701
5.1 Verify tasks and task requirements	
5.2 Identify robots and robotics systems	
5.3 Use selected robots and robotics systems	
6. Operate robots and robotics systems	UA49801
6.1 Conduct pre-operational checks	
6.2 Use robots and robotics systems	
6.3 Shut-down robots and robotics systems	

Mandatory Units (All must be completed)

CODES

- | | | |
|------------|---|----------------|
| 7. | Diagnose and repair faults | UA49901 |
| 7.1 | Prepare for task diagnosis | |
| 7.2 | Identify faults | |
| 7.3 | Repair faults | |
| 7.4 | Shut-down robots and robotics systems | |
| 8. | Contribute to the designing of robots and robotics systems | UA50001 |
| 8.1 | Prepare for the design process | |
| 8.2 | Participate in the design process | |
| 8.3 | Review designs | |
| 9. | Operate a smart device | UA50101 |
| 9.1 | Start smart device | |
| 9.2 | Use smart device | |
| 9.3 | Shut down smart device | |
| 10. | Use basic coding to programme robots | UA50201 |
| 10.1 | Confirm task requirements | |
| 10.2 | Build code to meet task requirements | |
| 10.3 | Run and check code | |

UA49301

Manage personal and professional development

Unit Descriptor:

This unit deals with the knowledge, skills and attitudes required to manage self and improve skills. It also deals with managing tasks to achieve required outcomes and looks at learning needs and reviewing performance to improve oneself.

ELEMENT**PERFORMANCE CRITERIA**

Candidates must be able to:

- | | |
|------------------------|--|
| 1. Organise work | <ul style="list-style-type: none"> 1.1 Consult with relevant persons to establish work priorities and timelines according to organisational procedures. 1.2 Plan work and manage own time so that tasks are completed in order of priority and established timelines. 1.3 Reschedule and re-prioritise where necessary to accommodate important variations in work assigned. 1.4 Document details of work tasks and outcomes according to organisational procedures. 1.5 Identify difficulties and changes affecting work performance, record and report to relevant persons according to organisational procedures. 1.6 Maintain and update records of work completed and commitments made according to organisational procedures. |
| 2. Direct own learning | <ul style="list-style-type: none"> 2.1 Identify skills and competency requirements for effective performance through research and consultation with relevant persons. 2.2 Identify own learning requirements to achieve work assigned and address gaps in the required skills and competencies for effective performance of work. 2.3 Liaise and consult with relevant persons to create opportunities to meet learning requirements within the limits of own and organisational authority. |

- 2.4 Use available strategies and methods as opportunities to improve learning requirements and collect evidence to show achievements.
- 2.5 Obtain and act on constructive feedback to improve own performance.
- 3. Review performance
 - 3.1 Conduct self-checks and seek feedback from relevant persons on work progress and ways of improving own performance.
 - 3.2 Assess feedback received and apply as necessary to improve own performance.
 - 3.3 Identify gaps between current skill set and that required for the work role.
 - 3.4 Consult with relevant persons and create a development plan to address gaps in competencies and performance.
 - 3.5 Identify support mechanisms to assist in the development of own performance.
 - 3.6 Assess own performance after the implementation of improvement measures and record results according to organisational procedures.
 - 3.7 Continue to monitor performance and introduce further improvement measures as required.
 - 3.8 Maintain personal health and safety and follow environmental regulations and guidelines while working.

RANGE STATEMENT

All range statements must be assessed:

1. Difficulties may include but are not limited to:

- Personal
- Environmental
- Interpersonal
- Intrapersonal

UNDERPINNING KNOWLEDGE AND SKILLS

Candidates must know and understand:

1. How and why it is important to consult with relevant persons to establish work priorities and timelines and what are the organisational procedures for doing so.
2. How to plan work activities and which methods to use to manage time so that tasks are completed in order of priority and established timelines.
3. When to reschedule and re-prioritise work to accommodate important variations in work assigned.
4. What are the organisational procedures for accurately documenting details of work tasks and outcomes.
5. How and why it is important to identify difficulties and changes affecting own work performance.
6. When and how to record and report difficulties and changes affecting own work performance to relevant persons.
7. Why it important to maintain records and update documents of work tasks and commitments according to organisational procedures.
8. How to identify skills and competency requirements for effective performance of work through research and consultation with relevant persons.
9. Why it is important and how to identify own learning requirements to achieve work.
10. How to address gaps in skills and competencies required for effective work performance.
11. When to liaise and consult with relevant persons to create opportunities to meet learning requirements within the limits of individual and organisational authority.
12. What are available strategies and methods and when to use them to create opportunities to improve learning requirements.
13. How to and why it is important to collect evidence to show achievements of learning.
14. How to receive and act on constructive feedback obtained and what are the organisational procedures for doing so.
15. When and how to carry out self checks on work progress.
16. Why it is important to seek feedback from relevant persons on work progress and what are the ways of improving performance.
17. How to assess feedback given on own performance and how to apply it appropriately to improve performance.
18. How to identify gaps between own current skill set and that required for the work role.
19. When to consult with relevant persons and how to create a development plan.
20. What are the organisational procedures for developing a development plan.

21. What are and how to identify support mechanisms to help in the development of own performance.
22. How to assess own performance after the implementation of improvement measures.
23. How to record results and why it is important to continue to monitor performance and introduce further improvement measures as required.
24. How to maintain personal health and safety and follow environmental regulations and guidelines while working.

EVIDENCE GUIDE

For assessment purposes:

(1) Critical Aspects of Evidence

Candidates must prove that they can carry out **all** the elements, meeting **all** of the performance criteria, range and underpinning knowledge **on more than one occasion**. This evidence must come from a real working environment.

(2) Methods of Assessment

Assessors should gather a range of evidence that is valid, sufficient, current and authentic.

Evidence may be collected in a variety of ways including:

- Observation
- Written/oral questioning
- Witness testimony
- Personal statement
- Written evidence (projects or assignments)
- Case study and scenario analysis
- Role play/simulation

(3) Context of Assessment

This unit may be assessed on the job, off the job or a combination of both. Where assessment occurs off the job, that is, the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by a candidate working alone or as part of a team. The assessment environment should not disadvantage the candidate.

The candidates must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, products and manufacturing specifications, codes, standards, manuals and reference materials.

Simulation **must not be used**, except in exceptional circumstances where natural work evidence is unlikely to occur.

UA49401

Maintain codes of conduct and safety procedures in the workspace

Unit Descriptor:

This unit deals with the knowledge, skills and attitudes required to maintain established codes of conduct and safety procedures for the robots and robotics systems workspace. These safety procedures are based on the legal regulations for the personal health, safety and environmental requirements that must be complied with for safe work. The unit also covers how to be proactive in keeping current with the necessary regulations.

ELEMENT**PERFORMANCE CRITERIA**

Candidates must be able to:

- | | |
|--|--|
| 1. Confirm procedures to be maintained | <ul style="list-style-type: none"> 1.1 Consult with relevant persons to identify codes of conduct and safety procedures, regulations and legislation applicable to working with robots and robotics systems. 1.2 Contribute to the documentation of identified procedures applicable to the robots and robotics systems workspace. 1.3 Communicate and summarise own and other persons' responsibilities and expectations working within the assigned workspace according to organisational procedures. 1.4 Agree upon, with relevant persons, identified procedures that must be maintained according to organisational objectives. 1.5 Maintain communication on codes of conduct and safety procedures by asking questions and seeking clarity on matters from relevant persons. |
| 2.. Conduct safe work practices | <ul style="list-style-type: none"> 2.1 Select and wear the appropriate personal protective equipment for the task according to organisational and occupational health and safety requirements. |

- 2.2 Select and use safety equipment, tools and materials necessary for the task according to organisational and occupational health and safety requirements.
 - 2.3 Follow safety signs and symbols as per established regulations.
 - 2.4 Provide information to relevant persons to demonstrate own understanding of what is required of the tasks.
 - 2.5 Work in safe manner and adhere to confirmed **codes of conduct** and **safety procedures** for the workspace according to organisational and occupational health and safety requirements.
 - 2.6 Deal with inappropriate behaviours and report, and resolve issues raised within the limits of own authority to relevant personnel according to organisational procedures.
 - 2.7 Record and report to relevant persons, possible hazards or unsafe practices observed or experienced while working according to organisational procedures.
3. Improve performance
 - 3.1 Reflect on own performance and encourage others to reflect on their performance using approved organisational methods.
 - 3.2 Identify and record possible areas for improvement as an outcome of the reflection process according to organisational procedures.
 - 3.3 Contribute constructive feedback and make recommendations to relevant persons regarding general adherence to **codes of conduct** and **safety regulations**.
4. Complete work activities
 - 4.1 Review completed tasks and document according to organisational procedures.
 - 4.2 Shut-down and store equipment, tools and machinery used according to manufacturer's guidelines and organisational procedures.

4.3 Document information according to organisational procedures.

RANGE STATEMENT

All range statements must be assessed:

1. Codes of conduct may include but are not limited to:

- Acceptable language
- Acceptable behaviours
- Hygiene standards

2. Safety procedures may include but are not limited to:

- Personal, e.g. personal protective equipment (PPE)
- Equipment, machinery, tools
- Environment, e.g. use of chemicals, disposal of materials
- Space

UNDERPINNING KNOWLEDGE AND SKILLS

Candidates must know and understand:

1. How to consult with relevant persons to identify codes of conduct and safety procedures, regulations and legislation that are applicable to working with robots and robotics systems.
2. How to agree on and why it is important to know and understand the codes of conduct and safety procedures that must be maintained for safe work.
3. How and when to contribute to the documentation of identified procedures that are applicable to robots and robotics systems workspace.
4. How to communicate effectively and the importance of maintaining regular communication.
5. How to summarise own and others' responsibilities and expectations within the workspace.
6. How to and why it is important to ask questions and seek clarity on matters from relevant persons.
7. Which personal protective equipment to select and how to use it effectively.
8. What safety equipment is required for use with equipment, tools and materials.
9. What do safety signs and symbols mean.
10. How to demonstrate an understanding of what is required for tasks to relevant persons.
11. Why it is important to work safely adhering to codes of conduct and safety procedures and how to do so.
12. How to deal with inappropriate behaviours and resolve and report issues raised within the limits of own authority according to organisational procedures.
13. What are the organisational recording and reporting procedures for possible hazards or unsafe practices observed or experienced while working.
14. Which methods to use in reviewing completed tasks.
15. What are the organisational procedures for documenting information.
16. How to and why it is important to reflect on own performance.
17. How to encourage others to reflect on their own performance using approved organisational methods.
18. How to identify and record possible areas for improvement as an outcome of the reflection process according to organisational procedures.
19. When to contribute constructive feedback and make recommendations to relevant persons regarding general adherence to codes of conduct and safety regulations.
20. How to safely shut-down and store equipment, tools and machinery used according to manufacturer's guidelines and organisational procedures.

EVIDENCE GUIDE

For assessment purposes:

(1) Critical Aspects of Evidence

Candidates must prove that they can carry out **all** the elements, meeting **all** of the performance criteria, range and underpinning knowledge **on more than one occasion**. This evidence must come from a real working environment.

(2) Methods of Assessment

Assessors should gather a range of evidence that is valid, sufficient, current and authentic.

Evidence may be collected in a variety of ways including:

- Observation
- Written/oral questioning
- Witness testimony
- Personal statement
- Written evidence (projects or assignments)
- Case study and scenario analysis
- Role play/simulation

(3) Context of Assessment

This unit may be assessed on the job, off the job or a combination of both. Where assessment occurs off the job, that is, the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by a candidate working alone or as part of a team. The assessment environment should not disadvantage the candidate.

The candidates must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, products and manufacturing specifications, codes, standards, manuals and reference materials.

Simulation **must not be used**, except in exceptional circumstances where natural work evidence is unlikely to occur.

UA49501

Collaborate with others

Unit Descriptor:

This unit deals with the knowledge, skills and attitudes required to work collaboratively with others. It covers communicating with individuals from diverse backgrounds and dealing with cultural misunderstandings.

ELEMENT**PERFORMANCE CRITERIA**

Candidates must be able to:

- | | |
|--|--|
| 1. Communicate with individuals from diverse backgrounds | <ul style="list-style-type: none"> 1.1 Confirm approved methods of communication according to organisational procedures. 1.2 Use effective listening skills, ask questions to gain additional information and clarify understanding. 1.3 Follow rules of ethics and protocol established by the organisation. 1.4 Treat individuals and groups from different backgrounds, cultures and languages with respect and sensitivity. 1.5 Communicate and cooperate with individuals from different backgrounds while carrying out organisational tasks and activities. 1.6 Respond to organisational situations in a manner that considers different traditions and ways of communicating and values and respects differences in cultures, language and backgrounds. |
| 2. Deal with cultural misunderstandings | <ul style="list-style-type: none"> 2.1 Identify issues which may cause conflict or misunderstandings in the organisation and communicate to relevant persons. 2.2 Address difficulties with those involved within the limits of own authority and seek assistance from relevant persons where required. 2.3 Work with others to resolve cultural misunderstandings and refer those outside the limits of own authority to appropriate persons. |

- 3. Work with others
 - 3.1 Confirm that others know and understand the approved organisational methods of communication, ethics and protocols to be used.
 - 3.2 Conduct work in accordance with the role and responsibilities of assigned tasks.
 - 3.3 Contribute to the achievement of required outcomes, consult with others and participate in activities.
 - 3.4 Collaborate with relevant others to resolve problems through agreed and accepted processes of the organisation.
 - 3.5 Make suggestions for improvements to processes for the achievement of tasks according to organisational procedures.
 - 3.6 Conduct work maintaining personal health, safety and environmental regulations according to organisational procedures and established regulations.

RANGE STATEMENT

All range statements must be assessed:

1. Backgrounds, cultures may include but are not limited to:

- Race/ethnic origin
- Language
- Special needs
- Family structure
- Gender
- Age
- Sexual preference

2. Different traditions and ways of communicating may include but are not limited to:

- Appropriate ways of greeting and parting
- Levels of formality
- Work ethics
- Family obligations
- Customs
- Social values
- Dress and grooming
- Non-verbal behaviour, understanding and interpretations
- Observance of special religious feasts or other celebratory days
- Product preferences

UNDERPINNING KNOWLEDGE AND SKILLS

Candidates must know and understand:

1. What are the approved methods of communication for the organisation.
2. How to demonstrate effective listening skills and the importance of effective listening.
3. Why it is important to ask questions to gain additional information and clarify understanding.
4. What are the rules of ethics and protocols established by the organisation that must be followed.
5. How and why it is important to treat individuals and groups from different backgrounds, cultures and languages with respect and sensitivity.
6. Which methods and techniques to use to communicate and cooperate effectively with individuals from different backgrounds when carrying out organisational tasks and activities.
7. How to value and respect differences in cultures and backgrounds while communicating in organisational situations.
8. How to work with others to resolve misunderstandings, while considering cultural differences and refer those outside of limits of own authority to appropriate persons.
9. Why and when to confirm that others know and understand methods of communication, ethics and protocols approved by the organisation.
10. What are your role and responsibilities in assigned tasks according to organisational procedures.
11. What methods to use and how to contribute to the achievement of required outcomes for assigned tasks.
12. How to collaborate with others to resolve problems.
13. What are the agreed and accepted processes of the organisation for resolving problems.
14. What suggestions to make for improvements to processes.
15. Why it is important to make suggestions to improve the achievement of tasks.
16. How to work safely.
17. What are the personal health, safety and environmental regulations that must be maintained for safe work.

EVIDENCE GUIDE

For assessment purposes:

(1) Critical Aspects of Evidence

Candidates must prove that they can carry out **all** the elements, meeting **all** of the performance criteria, range and underpinning knowledge **on more than one occasion**. This evidence must come from a real working environment.

(2) Methods of Assessment

Assessors should gather a range of evidence that is valid, sufficient, current and authentic.

Evidence may be collected in a variety of ways including:

- Observation
- Written/oral questioning
- Witness testimony
- Personal statement
- Written evidence (projects or assignments)
- Case study and scenario analysis
- Role play/simulation

(3) Context of Assessment

This unit may be assessed on the job, off the job or a combination of both. Where assessment occurs off the job, that is, the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by a candidate working alone or as part of a team. The assessment environment should not disadvantage the candidate.

The candidates must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, products and manufacturing specifications, codes, standards, manuals and reference materials.

Simulation **must not be used**, except in exceptional circumstances where natural work evidence is unlikely to occur.

UA49601

Participate in researching new robotics technologies

Unit Descriptor:

This unit deals with the knowledge, skills and attitudes required to participate in researching new trends and technologies in the area of robots and robotics systems.

It focuses on how to research, identify and incorporate relevant information and seeks to encourage learners to maintain currency of knowledge and skills in the occupational area.

ELEMENT**PERFORMANCE CRITERIA**

Candidates must be able to:

- | | |
|--|--|
| 1. Research new trends and technologies | 1.1 Define and agree on the objectives of the research with relevant persons. |
| | 1.2 Use reliable, approved research methods according to organisational policies. |
| | 1.3 Contribute to researching new trends and technologies using approved research methods and sources. |
| | 1.4 Collect and document information according to organisational requirements. |
| 2. Incorporate new trends and technologies | 2.1 Present collected information to relevant persons and obtain feedback in accordance with organisational practices. |
| | 2.2 Record feedback and obtain approval to proceed from relevant persons. |
| | 2.3 Confirm with relevant persons, that new trends and technologies are appropriate for use in assigned tasks. |
| | 2.4 Integrate new trends and technologies according to established procedures. |
| | 2.5 Record and report incorporated new trends and technologies in keeping with organisational requirements. |

3. Monitor the performance of incorporated new trends and technologies
 - 3.1 Update relevant others on incorporated **new trends and technologies**.
 - 3.2 Examine incorporated **new trends and technologies** and record findings as required.
 - 3.3 Seek feedback from relevant persons on incorporated **new trends and technologies** and make informed decisions to adjust and implement recommendations.
 - 3.4 Maintain personal health, safety and environmental regulations to minimise risk to self and others.

RANGE STATEMENT

All range statements must be assessed:

1. Research methods may include but are not limited to:

- Online via internet and other search machines
- Manually
- Informal search

2. New trends and technologies may include but are not limited to:

- Applications, i.e. areas where robots and robotics systems are being used
- Improvements in efficiency and effectiveness
- Safety features

UNDERPINNING KNOWLEDGE AND SKILLS

Candidates must know and understand:

1. What are the objectives of the research and the approved organisational methods for research.
2. How to participate in researching new trends and technologies in robots and robotics systems.
3. Why it is important to participate in researching new trends and technologies in robots and robotics systems and how to do so.
4. What are the organisational procedures for the collection and documentation of information.
5. How to present information and obtain feedback from relevant persons.
6. Which methods to use for the incorporation of new trends and technologies in robots and robotics systems.
7. What information relating to new trends and technologies is relevant and should be shared with others.
8. How to examine incorporated new trends and technologies.
9. Why it is important to seek feedback from customers and other relevant persons and what are the methods for doing so.
10. When to adjust and implement recommendations obtained from constructive feedback.
11. When to research and source information on new trends and technologies.

EVIDENCE GUIDE

For assessment purposes:

(1) Critical Aspects of Evidence

Candidates must prove that they can carry out **all** of the elements, meeting **all** the performance criteria, range and underpinning knowledge **on more than one occasion**. This evidence must come from a real working environment.

(2) Method of Assessment

Assessors should gather a range of evidence that is valid, sufficient, current and authentic.

Evidence may be collected in a variety of ways including:

- Observation
- Written/oral questioning
- Written evidence
- Witness testimony
- Professional discussion

Questioning techniques should not require language, literacy or numeracy skills beyond those required in this unit of competency.

(3) Context of Assessment

This unit may be assessed on the job, off the job or a combination of both. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by a candidate working alone or as part of a team. The assessment environment should not disadvantage the candidate.

The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.

Simulation **should not be used**, except in exceptional circumstances where natural work evidence is unlikely to occur.

UA49701**Identify and apply robots and robotics systems**

Unit Descriptor:

This unit deals with the knowledge, skills and attitudes required to identify and apply robots and robotics systems that meet task requirements. It involves examining tasks and task requirements and identifying and selecting robots and robotics systems that best satisfy them. The unit further speaks to applying selected robots and robotics systems to satisfy tasks and task requirements.

ELEMENT**PERFORMANCE CRITERIA***Candidates must be able to:*

- | | |
|---|---|
| 1. Verify tasks and task requirements | 1.1 Obtain tasks and task requirements from relevant persons. |
| | 1.2 Confirm that tasks and task requirements are within own scope of competencies and level of authority. |
| | 1.3 Agree on recording and reporting procedures in accordance with relevant persons within the organisation. |
| | 1.4 Sign off on tasks and task requirements with relevant persons. |
| 2. Identify robots and robotics systems | 2.1 Examine tasks and task requirements considering different types of robots and robotics systems. |
| | 2.2 Identify and list the main types of robots and robotics systems that meet task and task requirements. |
| | 2.3 Select robots and robotics systems best suited to tasks and task requirements and confirm availability for use. |
| 3. Use selected robots and robotics systems | 3.1 Conduct pre-start up checks for selected robots and robotics systems in a safe manner according to manufacturer's guidelines. |
| | 3.2 Select and use robots and robotics system to meet the tasks and task requirements. |

- 3.3 Monitor robots and robotics systems while in use, resolve problems within the limits of own authority and refer those outside to appropriate persons.
- 3.4 Record and report the results of tasks according to organisational procedures.
- 3.5 Shut-down robots and robotics systems according to manufacturer's guidelines.
- 3.6 Store robots and robotics systems according to manufacturer's guidelines and organisational procedures.

RANGE STATEMENT

All range statements must be assessed:

1. **Tasks and task requirements** may include but are not limited to:
 - Appropriate competencies and skills level
 - Appropriate complexity and degree of difficulty level

UNDERPINNING KNOWLEDGE AND SKILLS

Candidates must know and understand:

1. What are the tasks and the requirements of the tasks.
2. What are the recording and reporting organisational procedures.
3. Why it is important that tasks and task requirements are appropriate to competencies and skill levels of individuals.
4. Which methods to use in examining tasks and task requirements.
5. Why it is important to identify robots and robotics systems that meet tasks and task requirements.
6. What are the different types of pre-start up checks that must be conducted, why it is important that they are completed and how to do so.
7. How to work safely at all times and why it is important to do so.
8. How to apply robots and robotics systems to tasks and task requirements.
9. How to monitor the robots and robotics systems while in use and why it is important.
10. Which methods to use to confirm that the robots and robotics systems have completed tasks and task requirements.
11. How to shut-down robots and robotics systems according to manufacturer's guidelines.
12. Why it is important to store robots and robotics systems according to manufacturer's guidelines.
13. What are the organisational procedures for storing robots and robotics systems.

EVIDENCE GUIDE

For assessment purposes:

(1) Critical Aspects of Evidence

Candidates must prove that they can carry out **all** of the elements, meeting **all** the performance criteria, range and underpinning knowledge **on more than one occasion**. This evidence must come from a real working environment.

(2) Method of Assessment

Assessors should gather a range of evidence that is valid, sufficient, current and authentic.

Evidence may be collected in a variety of ways including:

- Observation
- Written/oral questioning
- Written evidence
- Witness testimony
- Professional discussion

Questioning techniques should not require language, literacy or numeracy skills beyond those required in this unit of competency.

(3) Context of Assessment

This unit may be assessed on the job, off the job or a combination of both. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by a candidate working alone or as part of a team. The assessment environment should not disadvantage the candidate.

The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.

Simulation **should not be used**, except in exceptional circumstances where natural work evidence is unlikely to occur.

UA49801

Operate robots and robotics systems

Unit Descriptor:

This unit deals with the knowledge, skills and attitudes required to operate robots and robotics systems and involves gaining knowledge of how to conduct pre-start up checks. The unit also speaks to the correct operation of robots and robotics systems and shutting them down when completed.

ELEMENT**PERFORMANCE CRITERIA**

Candidates must be able to:

- | | |
|------------------------------------|---|
| 1. Conduct pre-operational checks | <ul style="list-style-type: none"> 1.1 Check and confirm the pre-operational checks that must be carried out according to manufacturer's specifications and organisational procedures. 1.2 Agree with relevant persons on the recording and reporting procedures that must be followed in keeping with organisational procedures. 1.3 Confirm the availability of required equipment, tools and materials for pre-operational checks according to manufacturer's guidelines and organisational requirements. 1.4 Organise the sequence for conducting pre-operational checks in accordance with manufacturer's guidelines and best industry practices. 1.5 Conduct pre-operational checks and record and report results according to organisational procedures and manufacturer's recommendations. 1.6 Prepare robots and robotics systems for the next step according to sign-off received from pre-operational checks. |
| 2. Use robots and robotics systems | <ul style="list-style-type: none"> 2.1 Confirm that all pre-operational checks were conducted and review documented results according to organisational procedures. |

- 2.2 Confirm that selected robots and robotics systems are approved for operation in accordance with agreed procedures.
 - 2.3 Identify the **operational specifications** that must be adhered to for safe use of robots and robotics systems.
 - 2.4 Select and use the appropriate tools and equipment for the operation of robots and robotics systems.
 - 2.5 Activate and operate robots and robotics systems to meet task requirements according to manufacturer's guidelines and organisational procedures.
 - 2.6 Monitor the performance of robots and robotics systems during operation and document any issues experienced according to organisational procedures.
 - 2.7 Work in accordance with health, safety and environmental regulations and procedures.
 - 2.8 Complete task requirements and document the results according to organisational procedures.
3. Shut-down robots and robotics systems
 - 3.1 Confirm that task requirements were completed according to organisational procedures.
 - 3.2 Prepare robots and robotics systems for shutdown using manufacturer's guidelines and best industry practices.
 - 3.3 Shut-down robots and robotics systems in accordance with manufacturer's guidelines and best industry practices.
 - 3.4 Clean and store robots and robotics systems in accordance with manufacturer's guidelines.

RANGE STATEMENT

All range statements must be assessed:

1. Pre-operational checks may include but are not limited to:

- Safety
- Mechanical
- Electrical

2. Operational specifications may include but are not limited to:

- Speed
- Range of movements allowed
- Space

UNDERPINNING KNOWLEDGE AND SKILLS

Candidates must know and understand:

1. What are the pre-operational checks that must be conducted before using robots and robotics systems.
2. Why it is important to conduct pre-operational checks and how to do so.
3. What are the reporting and recording procedures of the organisation.
4. Why it is important to agree on the reporting and recording procedures with relevant persons.
5. What is the process for confirming the availability of equipment, tools and materials needed for pre-operational checks.
6. Why it is important to carry out pre-operational checks in the correct sequence.
7. What are the personal health, safety and environmental regulations that must be adhered to for the job tasks and the workspace.
8. What are the required tools, equipment and materials to ensure safety for self and others and for safe working in the workspace.
9. How to correctly use tools, equipment and materials to ensure safe work.
10. Why it is important to sign-off after the pre-operational checks and how to prepare for the next steps.
11. How to confirm that selected robots and robotics systems are approved for operation.
12. Which operational specifications must be adhered to for the safe operation of robots and robotics systems.
13. How to operate robots and robotics systems.
14. Which robots and robotics systems to select to meet task requirements.
15. How to monitor the operation of robots and robotics systems during their use.
16. Why it is important to document issues experienced while monitoring the operation of robots and robotics systems.
17. How to prepare for and shut-down robots and robotics systems.
18. Why it is important to work in accordance with health, safety and environmental regulations and procedures.
19. How to clean and store robots and robotics systems.

EVIDENCE GUIDE

For assessment purposes:

(1) Critical Aspects of Evidence

Candidates must prove that they can carry out **all** of the elements, meeting **all** the performance criteria, range and underpinning knowledge **on more than one occasion**. This evidence must come from a real working environment.

(2) Method of Assessment

Assessors should gather a range of evidence that is valid, sufficient, current and authentic.

Evidence may be collected in a variety of ways including:

- Observation of performance task
- Product of work
- Written/oral questioning
- Written evidence
- Witness testimony
- Professional discussion

Questioning techniques should not require language, literacy or numeracy skills beyond those required in this unit of competency.

(3) Context of Assessment

This unit may be assessed on the job, off the job or a combination of both. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by a candidate working alone or as part of a team. The assessment environment should not disadvantage the candidate.

The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.

Simulation **should not be used**, except in exceptional circumstances where natural work evidence is unlikely to occur.

UA49901

Diagnose and repair faults

Unit Descriptor:

This unit deals with the knowledge, skills and attitudes required to diagnose and repair faults within the limits of own authority within the organisational structure. It deals with planning, diagnosing, repairing and reinstating robots and robotics systems.

ELEMENT**PERFORMANCE CRITERIA**

Candidates must be able to:

- | | |
|-------------------------------|---|
| 1. Prepare for task diagnosis | <ul style="list-style-type: none"> 1.1 Identify required information for task diagnosis according to organisational procedures. 1.2 Identify tools, equipment and materials for the task diagnosis and confirm their availability for use. 1.3 Check and maintain safety, health and environmental requirements for working safely while carrying out tasks. 1.4 Record and report that the resources are available for the task diagnosis according to organisational procedures. 1.5 Prepare the work area for performing the task diagnosis and obtain approval to commence according to organisational procedures. |
| 2. Identify faults | <ul style="list-style-type: none"> 2.1 Confirm with relevant persons, the correct functioning parameters and agree on the results that must be satisfied. 2.2 Carry out the task diagnosis according to manufacturer's guidelines and organisational procedures. 2.3 Record the results of diagnostic tests and inform relevant persons of the results. 2.4 Use the results from diagnostic tests to identify faults according to manufacturer' guidelines for correct functioning. |

- 2.5 Report on identified **faults** according to organisational procedures.
 - 2.6 Consult with relevant persons and plan for the repair of identified **faults** to manufacturers guidelines and industry best practices.
- 3. Repair faults
 - 3.1 Confirm that the required tools, equipment and materials for repairs are available and obtain approval for accessing them as required.
 - 3.2 Carry out repairs according to manufacturer's guidelines and organisational procedures.
 - 3.3 Conduct work maintaining personal health and safety and environmental requirements.
 - 3.4 Inspect completed repairs and confirm that these repairs are satisfactory and adequate.
- 4. Shut-down robots and robotics systems
 - 4.1 Notify relevant persons that repairs were completed and obtain sign-off according to organisational procedures.
 - 4.2 Return and secure tools, equipment and materials to storage area in accordance with organisational health and safety procedures.
 - 4.3 Record and report on completed tasks according to organisational procedures.

RANGE STATEMENT

All range statements must be assessed:

1. **Faults** may include but are not limited to:
 - Electrical
 - Mechanical
 - Safety

UNDERPINNING KNOWLEDGE AND SKILLS

Candidates must know and understand:

1. What information is required for task diagnosis according to organisational procedures.
2. How to identify and confirm that the required tools, equipment and materials for diagnosis are available for use.
3. Which methods to use to carry out diagnostics.
4. Why it is important to check and maintain health, safety and environmental requirements while working.
5. How to carry out diagnostic activities according to manufacturer's guidelines and organisational procedures.
6. Who are the relevant persons that can confirm the correct functioning of robots and robotics systems.
7. What are the agreed parameters for the correct functioning of robots and robotics systems.
8. Why it is important to record the results of diagnostic tests and whom to inform of the results.
9. How to use the results of diagnostic tests to identify faults.
10. Why it is important to consult relevant persons and how to plan for repairs.
11. What are the different types of faults that can be identified.
12. Which methods to use for inspection of completed repairs.
13. Which methods to use for obtaining sign-off for completed repairs.
14. Why it is important to return and secure tools, equipment and materials used for repairs.
15. How to record and report completed tasks and why this is important.

EVIDENCE GUIDE

For assessment purposes:

(1) Critical Aspects of Evidence

Candidates must prove that they can carry out **all** of the elements, meeting **all** the performance criteria, range and underpinning knowledge **on more than one occasion**. This evidence must come from a real working environment.

(2) Method of Assessment

Assessors should gather a range of evidence that is valid, sufficient, current and authentic.

Evidence may be collected in a variety of ways including:

- Observation
- Written/oral questioning
- Written evidence
- Witness testimony
- Professional discussion

Questioning techniques should not require language, literacy or numeracy skills beyond those required in this unit of competency.

(3) Context of Assessment

This unit may be assessed on the job, off the job or a combination of both. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by a candidate working alone or as part of a team. The assessment environment should not disadvantage the candidate.

The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.

Simulation **should not be used**, except in exceptional circumstances where natural work evidence is unlikely to occur.

UA50001

Contribute to the designing of robots and robotics systems

Unit Descriptor:

This unit deals with the knowledge, skills and attitudes required to contribute to the designing of robots and robotics systems. It covers the purpose for designing and review of the design. The designing of robots and robotics systems is a collaborative process in which all contributions are acknowledged and seeks to allow creativity and innovation.

ELEMENT**PERFORMANCE CRITERIA**

Candidates must be able to:

- | | |
|--------------------------------------|---|
| 1. Prepare for the design process | 1.1 Agree on with relevant persons, the scope and limits of the design process according to task specifications. |
| | 1.2 Confirm the technologies to be used in the design process. |
| | 1.3 Verify the purpose for designing robots and robotics systems with relevant persons. |
| 2. Participate in the design process | 2.1 Consult with relevant persons in accordance with organisational procedures and agree on the outcomes from the consultative process. |
| | 2.2 Document the outcomes from the consultative process in keeping with organisational procedures. |
| | 2.3 Collaborate with relevant persons and list the design factors to be considered in the designing process. |
| | 2.4 Contribute to the design process according to agreed methods of the organisation. |
| | 2.5 Collaborate with relevant persons to produce conceptual designs and document according to organisational procedures. |
| | 2.6 Present conceptual designs for review and evaluation to relevant persons. |

- 3. Review designs
 - 3.1 Evaluate designs against established parameters in accordance with organisational procedures.
 - 3.2 Document the outcomes from the review process according to organisational procedures.
 - 3.3 Work with relevant persons to finalise designs in keeping with the next steps for implementation.
 - 3.4 Work in accordance with personal health, safety and environmental regulations and best industry practices.

RANGE STATEMENT

All range statements must be assessed:

1. **Design factors** may include but are not limited to:
 - Type of terrain/topological
 - Health, safety and environmental regulations
 - Application or use
 - Materials for fabrication
 - Power system

UNDERPINNING KNOWLEDGE AND SKILLS

Candidates must know and understand:

1. What are the scope and limits of the design process and why it is important to agree on them with relevant persons.
2. Why it is important to verify the purpose for designing.
3. How to confirm the technologies to be used in the design process.
4. How to and why it is important to consult and collaborate with relevant persons.
5. What methods to use in the consultative and collaborative processes.
6. What are the design factors to be considered in the design process.
7. What are the organisational procedures for documentation.
8. Which methods to use when participating with others to produce conceptual designs.
9. Why it is important to review presented designs against established parameters.
10. How to work in accordance with personal health, safety and environmental regulations and best industry practices.
11. What are the personal health, safety and environmental regulations and best industry practices that must be maintained.

EVIDENCE GUIDE

For assessment purposes:

(1) Critical Aspects of Evidence

Candidates must prove that they can carry out **all** the elements, meeting **all** of the performance criteria, range and underpinning knowledge **on more than one occasion**. This evidence must come from a real working environment.

(2) Methods of Assessment

Assessors should gather a range of evidence that is valid, sufficient, current and authentic.

Evidence may be collected in a variety of ways including:

- Observation
- Written/oral questioning
- Witness testimony
- Personal statement
- Written evidence (projects or assignments)
- Case study and scenario analysis
- Role play/simulation

(3) Context of Assessment

This unit may be assessed on the job, off the job or a combination of both. Where assessment occurs off the job, that is, the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by a candidate working alone or as part of a team. The assessment environment should not disadvantage the candidate.

The candidates must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, products and manufacturing specifications, codes, standards, manuals and reference materials.

Simulation **must not be used**, except in exceptional circumstances where natural work evidence is unlikely to occur.

UA50101**Operate a smart device**

Unit Descriptor:

This unit deals with the knowledge, skills and attitudes required to operate a smart device. A smart device is defined as an electronic gadget that can connect, share and interact with its user and other smart devices. They are connected via different protocols such as WiFi, Bluetooth and G3 and can operate to an extent, interactively and autonomously. These smart devices are external devices.

ELEMENT**PERFORMANCE CRITERIA**

Candidates must be able to:

- | | | |
|----|--------------------|--|
| 1. | Start smart device | 1.1 Identify and select smart devices to be used according to organisational procedures and tasks. |
| | | 1.2 Conduct pre-operational checks as required according to manufacturer's guidelines. |
| | | 1.3 Report the results of pre-operational checks and obtain sign-off from relevant persons according to organisational procedures. |
| | | 1.4 Confirm task requirements in accordance with organisational procedures. |
| 2. | Use smart device | 2.1 Inspect and confirm that smart devices are ready for use according to manufacturers' guidelines and operational procedures. |
| | | 2.2 Maintain personal health and safety and organisational and environmental regulations for the safe operation of smart devices. |
| | | 2.3 Operate smart devices to satisfy task requirements according to manufacturers' guidelines. |
| | | 2.4 Monitor smart devices while in operation and record any problems experienced according to organisational procedures. |

- 2.5 Resolve problems within the limits of own authority and refer those problems outside of own limits to relevant persons.
- 2.6 Operate smart devices to complete tasks in accordance with manufacturers' guidelines and organisational procedures.
- 3. Shut-down smart device
 - 3.1 Report and obtain feedback from relevant persons on the completion of tasks according to organisational procedures.
 - 3.2 Agree that the shut-down of smart devices can take place with relevant persons.
 - 3.3 Shut-down smart devices according to manufacturers' guidelines.
 - 3.4 Document information in accordance with organisational procedures.
 - 3.5 Maintain personal health, safety and environmental regulations during work operations.

RANGE STATEMENT

All range statements must be assessed:

No range items

UNDERPINNING KNOWLEDGE AND SKILLS

Candidates must know and understand:

1. What are smart devices and the importance of their use.
2. What are the manufacturer's guidelines for pre-operational checks on smart devices.
3. How to report on pre-operational checks and why it is important to obtain sign-off from relevant persons.
4. Which methods to use for inspection and to confirm that smart devices are ready for use.
5. What are the personal health, safety and environmental regulations that must be maintained for the safe use of smart devices.
6. How to operate smart devices safely and use them to complete tasks.
7. Why it is important to monitor smart devices during their operation.
8. What methods to use in resolving problems within the limits of own authority.
9. When to report and obtain feedback from relevant persons on the completion of tasks using smart devices.
10. When to shut-down smart devices and what are the manufacturer's guidelines for doing so.
11. What are the main categories of smart devices and their different operating systems.

EVIDENCE GUIDE

For assessment purposes:

(1) Critical Aspects of Evidence

Candidates must prove that they can carry out **all** the elements, meeting **all** of the performance criteria, range and underpinning knowledge **on more than one occasion**. This evidence must come from a real working environment.

(2) Methods of Assessment

Assessors should gather a range of evidence that is valid, sufficient, current and authentic.

Evidence may be collected in a variety of ways including:

- Observation
- Written/oral questioning
- Witness testimony
- Personal statement
- Written evidence (projects or assignments)
- Case study and scenario analysis
- Role play/simulation

(3) Context of Assessment

This unit may be assessed on the job, off the job or a combination of both. Where assessment occurs off the job, that is, the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by a candidate working alone or as part of a team. The assessment environment should not disadvantage the candidate.

The candidates must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, products and manufacturing specifications, codes, standards, manuals and reference materials.

Simulation **must not be used**, except in exceptional circumstances where natural work evidence is unlikely to occur.

UA50201**Use basic coding to programme robots**

Unit Descriptor:

This unit deals with the knowledge, skills and attitudes required to use basic coding skills to programme robots to achieve specific tasks. It deals with using block-based coding on robotics software to resolve simple problems.

Candidates are expected to demonstrate knowledge of the specific robotics software being used and be able to work alone or as a member of a team or group to achieve task requirements.

ELEMENT**PERFORMANCE CRITERIA**

Candidates must be able to:

- | | |
|---|--|
| 1. Confirm task requirements | <ul style="list-style-type: none"> 1.1 Obtain task requirements from relevant persons according to the organisational procedures. 1.2 Confirm that task requirements are within the scope of own competencies and level of authority. 1.3 Agree on the reporting and recording procedures and sign off on task requirements with relevant persons. |
| 2. Build code to meet task requirements | <ul style="list-style-type: none"> 2.1 Identify and select the relevant blocks required to complete the assigned task. 2.2 Build code with the required blocks that will meet task requirements using basic coding skills. 2.3 Present the code to relevant persons and obtain feedback in accordance with task requirements. 2.4 Record the code in accordance with organisational procedures. |
| 3. Run and check code | <ul style="list-style-type: none"> 3.1 Turn on robot and load and run the code in accordance with manufacturer's guidelines and task requirements. 3.2 Define robot component functions and abilities to meet task requirements. |

- 3.3 Execute the code and identify and respond to **prompts** in accordance with organisational procedures and manufacturer's guidelines.
- 3.4 Operate robot and monitor performance to test and prove and adjust the code to meet task requirements.
- 3.5 Save the code when task requirements are satisfied in accordance with organisational procedures.
- 3.6 Report and record the results of programme performance according to organisational requirements.
- 3.7 Obtain sign-off and shut-down the robot according to manufacturer's guidelines and organisational procedures.
- 3.8 Comply with personal, health, safety and environmental regulations and guidelines.

RANGE STATEMENT

All range statements must be assessed:

1. **Basic coding skills** may include but are not limited to:
 - Order of blocks to form scripts
 - Association (i.e. using compatible blocks)
 - Manipulating parameters in blocks
 - Iteration (i.e. test and modify scripts)
2. **Robot components** may include but are not limited to:
 - Mobility/locomotion (e.g. wheels, legs, propellers, fins)
 - Motors
3. **Prompts** may include but are not limited to:
 - Error messages
 - Firmware update
 - Battery life
 - Faults

UNDERPINNING KNOWLEDGE AND SKILLS

Candidates must know and understand:

1. What are the task requirements, how to obtain them from relevant persons and what are the organisational procedures for doing so.
2. Why it is important to confirm that task requirements are within the scope of own competencies and level of authority.
3. Why it is important to agree on reporting and recording procedures.
4. How to obtain sign-off and feedback on tasks from relevant persons and why this is important.
5. How to define the following key terms:
 - code
 - script
 - blocks
 - iteration
 - parameters
 - robot
6. How to identify, select and order blocks to build a script to accomplish a specific task.
7. How to turn on a robot, load and run the code to meet the task requirements.
8. Why a robot requires instructions to carry out functions.
9. Why it is important to define the functions and abilities of a robot's components when building the code to meet task requirements.
10. How to incorporate computational concepts when building the code to meet task requirements.
11. What are the relevant prompts that may be encountered when running a code on a robot and what are the manufacturer's guidelines for identifying them.
12. How to respond to prompts on a robot and what are the organisational procedures and manufacturer's guidelines for doing so.
13. How to operate a robot and monitor its performance when the code is being run.
14. How to test, prove and adjust the code used to programme a robot to meet task requirements.
15. How to save the code used to programme a robot and what are the organisational procedures for doing so.
16. How to shut-down a robot and what are the relevant manufacturer's guidelines and organisational procedures for doing so.
17. How to comply with the relevant personal, health, safety and environmental regulations and what are the guidelines for doing so.

EVIDENCE GUIDE

For assessment purposes:

(1) Critical Aspects of Evidence

Candidates must prove that they can carry out **all** the elements, meeting **all** of the performance criteria, range and underpinning knowledge **on more than one occasion**. This evidence must come from a real working environment.

(2) Methods of Assessment

Assessors should gather a range of evidence that is valid, sufficient, current and authentic.

Evidence may be collected in a variety of ways including:

- Observation
- Written/oral questioning
- Written evidence
- Witness testimony
- Professional discussion

(3) Context of Assessment

This unit may be assessed on the job, off the job or a combination of both. Where assessment occurs off the job, that is, the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by a candidate working alone or as part of a team. The assessment environment should not disadvantage the candidate.

The candidates must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, products and manufacturing specifications, codes, standards, manuals and reference materials.

Simulation **must not be used**, except in exceptional circumstances where natural work evidence is unlikely to occur.

Assessment methods

The methods which can be used to determine competence in performance and underpinning knowledge.

Assessors

The Assessor guides and assesses the candidate. His/her role is to determine whether evidence presented by a candidate for assessment within the programme meets the required standard of competence in the relevant unit or element. The Assessor needs to be competent to assess to national standards in the area under assessment.

Approved Centre

Organisation/Centre approved by the TVET Council to offer full National Vocational Qualifications.

Case Studies

In situations where it is difficult for workplace assessment to take place, case studies can offer the candidate an opportunity to demonstrate potential competence.

A case study is a description of an actual or imaginary situation presented in some detail. The way the case study is presented will vary depending upon the qualification, but the most usual methods are written, taped or filmed.

The main advantage of a case study is the amount of evidence of underpinning knowledge they can generate and the specific nature of the evidence produced.

Competence

In the context of vocational qualifications, competence means: the ability to carry out prescribed activities to nationally pre-determined standards in an occupation. The definition embraces cognitive, practical and behavioural skills, underpinning knowledge and understanding and the ability to react appropriately in contingency situations.

Element

An element is a description of an activity which a person should be able to do. It is a description of an action, behaviour or outcome which a person should be able to demonstrate.

Explanation of NVQ Levels

NVQs cover five (5) levels of competence, from entry level staff at Level 1 through to senior management at Level 5.

Level 1 - Entry Level

Recognises competence in a range of varied work activities performed in a variety of contexts. Most work activities are simple and routine. Collaboration with others through work groups or teams may often be a requirement. Substantial supervision is required especially during the early months evolving into more autonomy with time.

Level 2 - Skilled Occupations

Recognises competence in a broad range of diverse work activities performed in a variety of contexts. Some of these may be complex and non-routine and involve some responsibility and autonomy. Collaboration with others through work groups or teams and guidance of others may be required.

Level 3 - Technician and Supervisory Occupations

Recognises competence in a broad range of complex, technical or professional work activities performed in a wide variety of contexts, with a substantial degree of personal responsibility and autonomy. Responsibility for the work of others and the allocation of resources are often a requirement. The individual is capable of self-directed application, exhibits problem solving, planning, designing and supervisory capabilities.

Level 4 - Technical Specialist and Middle Management Occupations

Recognises competence involving the application of a range of fundamental principles and complex techniques across a wide and unpredictable variety of contexts. Requires very substantial personal autonomy and often significant responsibility for the work of others, the allocation of resources, as well as personal accountability for analysis, diagnosis, design, planning, execution and evaluation.

Level 5 - Chartered, Professional and Senior Management Occupations

Recognises the ability to exercise personal professional responsibility for the design, development or improvement of a product, process, system or service. Recognises technical and management competencies at the highest level and includes those who have occupied positions of the highest responsibility and made outstanding contribution to the promotion and practice of their occupation.

External Verifier

The External Verifier is trained and appointed by the TVET Council and is competent to approve and ensure an approved Centre's quality of provision.

Internal Verifier

The Internal Verifier acts in a supporting role for Assessors to ensure consistent quality of assessment and competence. They need to be competent to assess to national standards in the area under assessment.

NVQ

National Vocational Qualifications (NVQs) are work-based qualifications that assess an individual's competence in a work situation and certify that the individual can perform the work role to the standards expected in employment.

NVQs are based on national occupational standards of competence drawn up by standards-setting bodies known as Industry Lead Bodies. The standards describe the level and breadth of performance that is expected of persons working in the industry or sector which the NVQ covers.

NVQ Coordinator

The NVQ Coordinator is the centre contact within each approved Centre offering NVQs. He/she has overall responsibility for the operation and administration of the NVQ system

Observation

Observation of the candidate carrying out his/her job in the workplace is the assessment method recommended in the vast majority of units and elements. Observation of staff carrying out their duties is something that most supervisors and managers do every day.

Performance Criteria

Performance criteria indicate what is required for the successful achievement of an element. They are descriptions of what you would expect to see in competent performance.

Product of Work

This could be items produced during the normal course of work which can be used for evidence purposes such as reports, menus, promotional literature, training plans, etc.

Questioning

Questioning is one of the most appropriate ways to collect evidence to assess a candidate's underpinning knowledge and understanding.

Questioning can also be used to assess a candidate in those areas of work listed in the range which cannot be assessed by observation. Guidance on when this assessment method can be used is given in the assessment guidance of each individual element.

As an assessment method, questioning ensures you have all of the evidence about a candidate's performance. It also allows you to clarify situations.

Range statements

The range puts the element of competence into context. A range statement is a description of the range of situations to which an element and its performance criteria is intended to apply.

Range statements are prescriptive; therefore each category must be assessed.

Role-plays

Role-plays are simulations where the candidate is asked to act out a situation in the way he/she considers "real" people would behave. By using role-play situations to assess a candidate you are able to collect evidence and make a judgment about how the candidate is most likely to perform. This may be necessary if the range specified includes a situation in which the candidate is unlikely to find himself/herself in the normal course of their work, or where the candidate needs to develop competence before being judged competently, for example, in a disciplinary situation.

Simulations

Where possible, assessment should always be carried out by observing **natural performance** in the workplace. **Simulated performance**, however, can be used where specified to collect evidence about an aspect of the candidate's work which occurs infrequently or is potentially hazardous, for example, dealing with fires.

By designing the simulated situation, briefing the candidate and observing his/her performance, you will be able to elicit evidence which will help you judge how a candidate is **most likely** to perform in real life.

Supplementary evidence

Supplementary evidence can be used to confirm and support performance evidence. Types of supplementary evidence include witness testimonies, reports, journals or diaries, records of activities, personal statements, simulation (see note in glossary).

Underpinning knowledge

Underpinning knowledge indicates what knowledge is essential for a person to possess in order to successfully achieve an element and prove total competence.

Units

A unit of competence describes one or more activities which form a significant part of an individual's work. Units are accredited separately but in combination can make up a vocational qualification. There are two categories of units:

Mandatory units - are core to a qualification and must be completed.

Optional units - candidates must choose the required number of individual units, specified in the qualification structure, to achieve the qualification.

Work-based projects

Work-based projects are a useful way for you to collect evidence to support any decision you make about a candidate's performance. They are particularly appropriate in determining the level of a candidate's underpinning knowledge and understanding where it may be insufficient to rely only on questioning observation.

A project often involves the identification of a solution to a specific problem identified by you and/or the candidate (such as looking at ways to redress a recent drop in sales), or may be a structured programme of work built around a central situation or idea (such as the introduction of a new job rostering process)