



## **Stage 6 Syllabus**

# **ELECTROTECHNOLOGY**

## **Curriculum Framework**

### **Part B**

## **Units of Competency and HSC Requirements**

**for implementation from 2008**

**Electrotechnology (120 indicative hours)**

**Electrotechnology (240 indicative hours)**

**2007**

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## The Electrotechnology Curriculum Framework

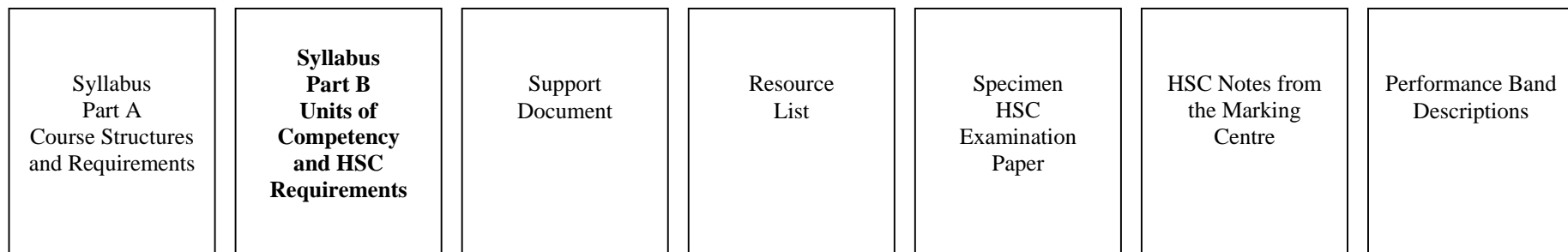
The Electrotechnology Curriculum Framework has been developed to provide students with the opportunity to gain credit towards the NSW Higher School Certificate and credit towards national vocational qualifications in the electrotechnology industry under the Australian Qualifications Framework. The Framework is based on the national Electrotechnology Training Package (UEE06).

This Industry Curriculum Framework incorporates all Higher School Certificate Electrotechnology VET courses including:

- courses delivered by schools
- courses delivered by TAFE colleges
- courses delivered by other Registered Training Organisations on behalf of schools or TAFE colleges.

This document, Part B of the *Electrotechnology Curriculum Framework Stage 6 Syllabus*, contains the text of the units of competency from the Electrotechnology Training Package (UEE06). Each examinable unit of competency is accompanied by HSC requirements and advice. The HSC requirements and advice column indicates the depth of study required for the purposes of the HSC. The terms, concepts and content contained in that column must be included in programming and delivery for the HSC.

### Electrotechnology Curriculum Framework Stage 6 Syllabus Documentation



## Electrotechnology Curriculum Framework – Units of Competency contained in Part B

This document contains the following units of competency together with HSC requirements and advice for each examinable unit. The HSC requirements and advice column indicates the depth of study required for the purposes of the HSC. The terms, concepts and content contained in that column must be included in programming and delivery for the HSC.

Unit code	Unit title	HSC indicative hours of credit	Page numbers
UEENEEC010A	Deliver a service to customers	10	13–27
UEENEEE001A	Apply OHS practices in the workplace	15	28–47
UEENEEE002A	Dismantle, assemble and fabricate electrotechnology components	30	48–66
UEENEEE003A	Solve problems in extra-low voltage single path circuits	30	67–82
UEENEEE004A	Solve problems in multiple path d.c. circuits	35	83–98
UEENEEE005A	Fix and secure equipment	15	99–114
UEENEEE048A	Carry out routine work activities in an electrotechnology environment	25	115–136

The following units of competency are available for download from the Electrotechnology Part B of the syllabus on the Board's website ([www.boardofstudies.nsw.edu.au](http://www.boardofstudies.nsw.edu.au)):

UEENEEA002A	Select electronic components	15	137–142
UEENEEED002A	Assemble, set-up and test personal computers	40	143–149
UEENEEED005A	Enter and verify operating instructions in microprocessor equipped devices	15	150–156
UEENEEE007A	Use drawings, diagrams, schedules and manuals	25	157–162
UEENEEE008A	Lay wiring/cabling and terminate accessories for extra-low voltage circuits	30	163–170
UEENEEE023A	Solve basic problems in electronic and digital equipment	40	171–177
UEENEEE040A	Identify and select components/accessories/materials for electrotechnology work activities	15	178–184

Unit code	Unit title	HSC indicative hours of credit	Page numbers
UEENEEE041A	Use routine equipment/plant/technologies in an electrotechnology environment	20	185–191
UEENEEF007A	Set up the wireless capabilities of communications and data storage devices	30	192–198
UEENEEH001A	Carry out basic repairs to computer equipment by replacement of modules/sub-assemblies	30	199–206
UEENEEH002A	Carry out basic repairs to electronic apparatus by replacement of components	30	207–214
UEENEEH004A	Set up and test residential audio/video equipment	30	215–222
UEENEEJ002A	Prepare refrigerant tubing and fittings	30	223–229
UEENEEK012A	Provide basic sustainable energy solutions for energy reduction in domestic premises	25	230–236
UEENEEK013A	Apply sustainable energy practice in daily activities	30	237–242
UEENEEK014A	Promote sustainable energy practice in the community	25	243–248
UEENEEC001A	Maintain documentation	10	249–254
UEENEEED001A	Use basic computer applications relevant to a workplace	10	255–260
UEENEEE020A	Provide basic instruction in the use of electrotechnology apparatus	10	261–266
Appendix 1	Language, Literacy and Numeracy	–	267–273
Appendix 2	Essential knowledge and associated skills	–	274–291
Appendix 3	Assessment methods	–	292–295
Appendix 4	Definitions/Glossary	–	296–319

The following **Key to Units** explains the purpose of each part of the layout of the units.

## Key to Units

<b>Training Package</b>	Electrotechnology (UEE06)	<b>Indicates the Training Package to which the unit of competency belongs.</b>		<b>HSC Requirements and Advice</b>
<b>Unit title</b>	<b>Deliver a service to customers</b>	<b>The sector of the Electrotechnology industry to which the unit mainly applies.</b>		<b>HSC Indicative Hours</b>
<b>Unit code</b>	<b>UEENEEC010A</b>	<b>Competency field</b>	Commercial	<b>Hours recognised for HSC credit.</b> <b>10</b>

<b>Unit descriptor</b>	This unit covers the interacting with customers to identify and meet their service needs. It encompasses following customer needs, identifying and resolving problems/issues and maintaining product standards, identifying customer needs, identifying and resolving problems/issues and maintaining product standards.	<b>General description of the scope of the work function to which the competency applies and the general abilities needed.</b>
<b>Application of the unit</b>	This unit is intended for competency development entry-level employment-based programs incorporating the following competencies.	
<b>Prerequisite unit(s)</b>	<b>Competencies</b> There are no prerequisite competencies to this unit.	<b>The way in which the unit is intended to be used in a learning program or qualification.</b>
	<b>Literacy and numeracy skills</b> Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in <i>Appendix 1 of this Syllabus</i> . Reading 3      Writing 3      Numeracy 3	<b>Inform the reading, writing and maths skill levels needed to achieve competency in the unit.</b>
<b>Licence to practise</b>	The skills and knowledge described in this unit do not require a licence to practise in the workplace directly related to occupational health and safety and where applicable contracts of training such as apprenticeships and traineeships.	

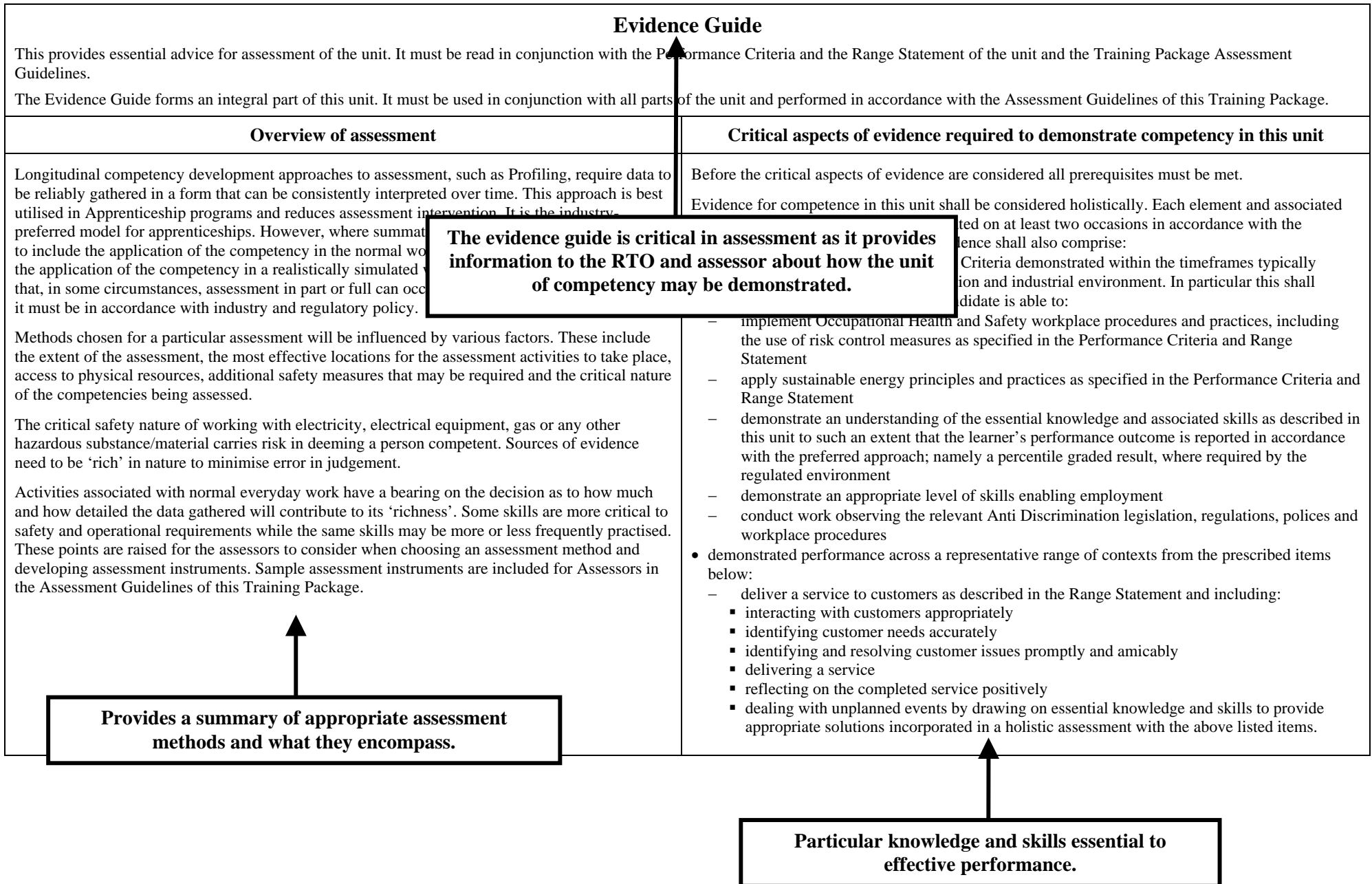
**Indicates how technical standards, codes of practice and regulatory requirements apply to the unit and whether a licence to practise is required.**

Required Skills and Knowledge	HSC Requirements and Advice
<p>This describes the essential skills and knowledge and their level <b>required</b> for this unit.</p> <p>Evidence shall show that knowledge has been acquired of safe working practices and delivering a service to customers.</p> <p>The extent of the essential knowledge and associated skills (EKAS) required is given in <i>Appendix 2</i> of this Syllabus. It forms an integral part of this unit.</p> <p>2.2.1 Enterprise communication methods</p> <p>2.2.2 Enterprise work activities records</p> <p>2.2.4 Problem solving techniques</p> <p>2.2.5 Enterprise customer relations protocols</p> <p>2.2.6 Enterprise quality management systems, basics</p> <p>2.2.13 User instruction techniques</p> <p>2.18.1 Occupational Health and Safety principles</p>	<p><b>Key Terms and Concepts</b></p> <ul style="list-style-type: none"> <li>• active listening</li> <li>• appropriate personnel</li> <li>• communication methods</li> </ul> <p><b>Key terms and concepts to be addressed when undertaking this unit of competency for the purposes of the HSC.</b></p> <ul style="list-style-type: none"> <li>• customer preferences, needs and expectations</li> <li>• customer, referrals</li> <li>• effective interpersonal skills</li> <li>• electrotechnology work environment</li> <li>• establishing good work habits</li> <li>• follow-up and feedback</li> <li>• handling complaints and difficult customers</li> <li>• hazard identification and risk control</li> <li>• internal and external customers</li> <li>• lines of reporting and communication</li> <li>• OHS policy and procedures</li> <li>• open closed and reflective questions</li> <li>• personal attributes</li> <li>• personal presentation standards</li> <li>• problem solving</li> <li>• quality system procedures</li> </ul>

**This section describes the essential skills and knowledge required for this unit. The knowledge component that is either explicit or implicit to effective performance.**

**Indicates the industry curriculum framework to which the unit of competency belongs.**

**Date of release for the HSC.**



## Evidence Guide cont/d

Context of and specific resources for assessment	Method of assessment	Concurrent assessment and relationship with other units
<p>This unit should be assessed as it related to normal work practice using procedures, information and resources typical of a workplace. This should include:</p> <ul style="list-style-type: none"> <li>• OHS policy and work procedures and instructions</li> <li>• suitable work environment, facilities, equipment and materials to undertake actual work as prescribed in this unit.</li> </ul> <p>These should be used in the formal learning/assessment environment.</p> <p>Note: Where simulation is considered a suitable strategy for assessment, conditions for assessment must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.</p> <p>The resources used for assessment should reflect current industry practices in relation to delivering a service to customers.</p>	<p>This unit shall be assessed by methods given in <i>Appendix 3 of this Syllabus</i>.</p> <p>Note: Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.</p>	<p>For optimisation of training and assessment effort, competence in this unit may be assessed concurrently with any unit or units that require formal documentation.</p>

**Indicates the acceptable methods of assessment as specified in the Training Package.**

**Identifies where benefits may be derived by assessing two or more units concurrently or sequentially.**

**Environment and resources acceptable for assessing achievement of competency.**

**Informs of the resources needed when simulating a real workplace and indicates when simulation of the workplace may be viable or necessary.**

## Evidence Guide cont/d

### Key competencies

Evidence of achievement of particular key competencies is assessed in the context of the following performance criteria.

*Performance level 1* Competence needed to undertake activities efficiently and with sufficient self management to meet the explicit requirements of the activity and to make judgements about quality of outcome against established criteria.

*Performance level 2* Competence needed to manage activities requiring the selection, application and integration of a number of elements and to select from established criteria to judge quality of process and outcome.

*Performance level 3* Competence needed to evaluate and reshape processes, to establish and use principles in order to determine appropriate ways of approaching activities and to establish criteria for judging quality of process and outcome.

Key competencies	Example of application	Performance level
How are ideas and information communicated within this competency?	Refer to the following Performance Criteria for examples of application: 2.1 to 2.4	1
How can information be collected, analysed and organised?	Refer to the following Performance Criteria for examples of application: 2.1; 2.2	1
How are activities planned and organised?	Refer to the following 1.1 to 1.4	<div style="border: 2px solid black; padding: 5px;"> <p><b>All Training Packages require the integration of Key competencies. The skills and knowledge they describe are essential for effective workplace participation and involve the sorts of capabilities commonly used by employers as selection criteria. They underpin the ability of employees to adapt to technological, organisational, societal and functional change.</b></p> </div>
How is team work used within this competency?	Refer to the following 1.2	
How are mathematical ideas and techniques used?	Refer to the following Performance Criteria for examples of application: N/A	–
How are problem solving skills applied?	Refer to the following Performance Criteria for examples of application: N/A	–
How is use of technology applied?	Refer to the following Performance Criteria for examples of application: 2.1 to 2.4	1

## Evidence Guide cont/d

### Skills enabling employment

Evidence that competency in this unit incorporates skills enabling employment is assessed in the context of the following performance.

The Competency Standard Units incorporate a range of employment-based skills that are expected of individuals in a workplace. The skills for employment set out below should be achieved and confirmed consistent with Competency Standard Unit requirements and relative to the qualification to which the unit contributes. Assessment must be applied holistically and confirm that the critical aspects of evidence have been demonstrated to the required level.

Skills for employment	Critical aspects of evidence	Example of application
1 Developing and using skills within a real workplace	Demonstrates an ability to develop and use spatial, dexterity and technology skills as well as health, safety and housekeeping skills meaningful to a workplace environment.	Refer to the following Performance Criteria for examples of application: All
2 Learning to learn in the workplace	Demonstrates an ability to access, confirm and learn – can access knowledge and culture related to and used in a workplace environment.	
3 Reflecting on the outcome and process of work task	Demonstrates an ability to reflect on performance of the work task, its outcome and the process(es) used in completing the task in a workplace environment.	
4 Interacting and understanding of the context of the work task	Demonstrates an ability to interact in real work tasks, understand the context of the task within a work environment and speak and write to related personnel/communities to a standard expected in the workplace/industry sector.	Refer to the following Performance Criteria for examples of application: 1.1; 1.2
5 Planning and organising the meaningful work task	Demonstrates an ability to prepare, organise and complete real work tasks to workplace standards, including selecting appropriate tools/equipment to complete tasks in a workplace environment, and setting and achieving personal goals.	Refer to the following Performance Criteria for examples of application: 1.1 to 1.4
6 Performing the work task in non-routine or contingent situations	Demonstrates an ability to seek and apply solutions to problems, using mathematical and cognitive skills relevant to a workplace environment, and/or seeking advice from appropriate personnel when in doubt.	Refer to the following Performance Criteria for examples of application: 2.4

**The unit of competency incorporates a range of employment-based skills that are expected of individuals in a workplace. The skills for employment should be achieved and confirmed consistent with the unit of competency requirements and relative to the qualification to which the unit contributes.**

Element	Performance Criteria	Range Statement	HSC Requirements and Advice
<p>1 Interact with customers.</p> <div data-bbox="143 504 551 817" style="border: 1px solid black; padding: 5px; margin-top: 20px;"> <p><b>Elements of competency are the basic building blocks of the unit of competency. They describe, in terms of outcome, the significant functions and tasks that a person in a particular area of work is able to perform.</b></p> </div>	<p>1.1 Communication with customers is conducted in a professional and courteous manner according to established procedures.</p> <div data-bbox="546 1134 1077 1303" style="border: 1px solid black; padding: 5px; margin-top: 20px;"> <p><b>The performance criteria indicate the level of performance that is required for each element. These are used as the tools for assessment.</b></p> </div>	<p>This relates to the unit as a whole providing the range of contexts and conditions to which the Performance Criteria apply. It allows for different work environments and situations that will affect performance.</p> <p>This unit must be demonstrated by delivering a service to customers in any of the electrotechnology disciplines.</p> <p>Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in <i>Appendix 4 of this Syllabus.</i></p> <div data-bbox="1025 938 1556 1062" style="border: 1px solid black; padding: 5px; margin-top: 20px;"> <p><b>The range of context and conditions to which performance criteria apply.</b></p> </div>	<p><b>Learning experiences for the HSC must address:</b></p> <p>Importance of communication in an electrotechnology work environment.</p> <p>Types of communication:</p> <ul style="list-style-type: none"> <li>• verbal</li> <li>• non-verbal</li> <li>• written.</li> </ul> <p>Types of customers including:</p> <ul style="list-style-type: none"> <li>• internal <ul style="list-style-type: none"> <li>○ workmates/colleagues/employees</li> <li>○ departments</li> </ul> </li> <li>• external.</li> </ul> <p>A knowledge of:</p> <div data-bbox="1599 695 2033 865" style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><b>Indicates the depth of study required for purposes of the HSC for the corresponding performance criteria.</b></p> </div> <ul style="list-style-type: none"> <li>• wo</li> <li>rel</li> <li>• inc</li> <li>cu</li> </ul> <p>The i</p> <p>comm</p> <ul style="list-style-type: none"> <li>• appropriate language</li> <li>• clear voice</li> <li>audible volume</li> <li>courteous tone</li> <li>active listening</li> <li>asking questions or rephrasing to clarify or confirm understanding.</li> </ul> <p>The importance of communicating in a language that is:</p> <ul style="list-style-type: none"> <li>• clear</li> <li>• concise</li> <li>• directive</li> <li>• purposeful</li> <li>• correct</li> <li>• courteous</li> <li>• culturally sensitive.</li> </ul> <p>An awareness of the importance of following workplace/enterprise set routines and procedures.</p>