

# NOCC-A21 Electrician: Competence Package

Relevant Occupation/trade title: Electrician			SAQA ID: 91761		
Learning Area 1: Prepare for work			Total Hours:		264
Learning Project 8: Apply fundamentals of electricity and basic electrical and mechanical engineering principles in trade related tasks			Total Hours:		40
Requisite learning areas/projects to be in place (Pre-requisite and co-requisite):		LA 1 - LP: 1, 7			
Learning project description: Apply fundamentals of electricity and basic electrical and mechanical engineering principles in trade related tasks					
Activity phase	Practical Skills Modules Content	Underpinning Knowledge Module Content	Work Experience Module Content (Exposure to be given)	Didactical-methodological advice	Learning materials/Tools and Equipment
Reference to QCTO Curriculum	PM: None	KM-03-KT01	WM: None		
Planning/ Preparation	<p><b><u>Provide access to (Given):</u></b> Different scenarios and drawings;</p> <p><b><u>Apprentices must be able to do/perform the following (hard and soft) skills:</u></b></p> <ul style="list-style-type: none"><li>Determine the different forms of energy</li><li>Explain the difference between alternating and direct current and the underlying principles</li><li>Explain the basic transformer principle</li><li>Explain the concepts of magnetism, resistance, current and voltage</li></ul>	<p><b><u>Knowledge of:</u></b></p> <ul style="list-style-type: none"><li>Principles and fundamental concepts of electricity</li><li>Concepts and production of electricity<ul style="list-style-type: none"><li>o Magnetism</li><li>o Basic transformer principle</li><li>o Understanding resistance, current and voltage</li></ul></li><li>Conductors and insulators</li><li>Ohms law (Resistive circuits only)</li><li>Kirchhoff's laws</li><li>Alternating current theory (incl. generation of electricity)</li><li>Direct current theory</li><li>Definitions, types, properties and</li></ul>	<p><b><u>Under supervision</u></b></p> <p>None</p>	Lecture, presentations, You-Tube videos Practical demonstration, Practical group work, Individual practice sessions under supervision	<p><b>Print materials, electronic files, software applications incl.:</b></p> <ul style="list-style-type: none"><li>Textbooks (electro technology, physics, mathematics etc.)</li><li>Teaching and learning manuals incl. multimedia applications</li></ul> <p><b>PPE:</b></p> <ul style="list-style-type: none"><li>Safety overall</li><li>Safety boots</li></ul>
Implementation/ Execution	<ul style="list-style-type: none"><li>Perform fundamental numerical calculations to solve routine electro-</li></ul>				

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	<p>technological (incl. Ohm's law and Kirchhoff's law) and electro-mechanical problems</p> <ul style="list-style-type: none"> <li>• Calculate missing values from a given electro technical drawing</li> <li>• Identify appropriate conductors and insulators and the relevant properties of relate materials</li> <li>• Explain basic electrical principles</li> </ul>	<p>applications of conductors, insulators and semi-conductors</p> <ul style="list-style-type: none"> <li>• Concepts, theories and principles of Electrical Circuits</li> <li>• Basic trade calculations incl.: <ul style="list-style-type: none"> <li>○ Mathematical calculations, linear measurement, areas, volumes, ratios</li> </ul> </li> <li>• Basic engineering principles incl.: <ul style="list-style-type: none"> <li>○ Basic physical quantities, concepts, principles, S.I. units, mass, velocity, acceleration, force, weight, density, angles, energy/work/power, moments/torque, centre of gravity, mechanical advantage, levers, etc.</li> </ul> </li> </ul>			
<b>Evaluation/ Documentation</b>	<ul style="list-style-type: none"> <li>• Evaluate and results against model answers</li> <li>• Perform basic housekeeping of work station</li> </ul>				
<b>Total</b>	Hours: 40				
<b>Specialisation additions</b>					
<b>Assessment guidance</b>					
<p><b>Criteria for assessment:</b></p> <ul style="list-style-type: none"> <li>○ Correct explanation of relevant principles</li> <li>○ Correct calculations</li> </ul>					