CORE COMPETENCIES

96 hours

This course is designed to equip individual with operational skills required for Core Electrical Competencies of Electrical Installation & Maintenance NC III with learning outcomes, methodology and assessment approach as listed herein. *Trainees who have completed training in or are holders of Electrical Installation & Maintenance NC II may forego training in core units of competency (1) to (3).*

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration

1. Perform roughing-in and wiring activities for three-phase distribution system for power, lighting and motor control panel	1.1 Selection of materials	• Read and familiarize:
		  ○ Types of wiring diagram based on ANSI or IEC Standard
		  ○ Types of enclosure, proofing and mounting configuration
		  ○ Types and uses of tools, materials and equipment for roughing-in activities
		• Practice proper used of safety harness
		• Interpret plan and details drawing
		• Identify and discuss the required proofing of the panel and enclosure
		• Identify and discuss the functional and defective tools, materials and equipment
			• Demonstration
			• Modular (self-paced)
			• Lecture/ Discussion
			• Audio Visual
			• Practical Laboratory
				• Oral questioning
				• Written test or examination
				• Demonstration
					4 Hrs

	1.2 Install cable tray and panel	• Interpret electrical/ mechanical drawing • Perform proper procedure in installation of cable tray and panels • Ensure that installation must accessible for maintenance purposes • Practice proper use of safety harness • Develop blueprint reading skills required to interpret work instructions • Perform the installation economically	• Demonstration • Modular (self-paced) • Lecture/ Discussion • Practical Laboratory	• Direct observation of application of tasks • Written test or examination • Demonstration with oral questioning	12 Hrs

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration

	1.3 Perform Wiring Work	• Read and familiarize:
		  ○ Wiring procedures such as cable lay-out, pulling, splicing and termination of wires
		  ○ Uses of different types of wires and cables and its application
		  ○ Application of pulling compound
		  ○ Bundling of wire size as per job requirements
		• Apply techniques in bending radius and loops tolerance
		• Practice proper handling of tools and equipment
		• Splice and terminate wires
		• Apply safety requirement for wiring works
			• Demonstration
			• Modular (self-paced)
			• Lecture/
			• Discussion
			• Audio Visual
			• Practical Laboratory
				• Direct observation of application of tasks
				• Oral questioning
				• Written test or examination
				• Demonstration
					16 Hrs

	1.4 Notify completion of work	• Read and familiarize:
		  ○ Processes, Operations Systems
		  ▪ Maintenance of tools & materials
		  ▪ Storage of tools
		• Check and conform the installation procedures based on job requirement
		• Practice good housekeeping
		• Perform commissioning activities
		• Document work
			• Demonstration
			• Modular (self-paced)
			• Lecture/ Discussion
			• Practical Laboratory
				• Direct observation of application of task
				• Written Test
				• Oral questioning
				• Demonstration
					4 Hrs.

2. Perform installation of data measurement and control system on electrical and auxiliary equipment	2.1 Plan and prepare works	• Read and familiarized:
		  ○ Type and specification of the needed devices.
		  ○ Function and the used of power supply of data measurement system and auxiliary equipment.
		• Identify the tools and materials according to the job requirements
		• Interpret plans & detail drawing
		• Practice proper handling of materials, tools and equipment
			• Demonstration
			• Modular (self-paced)
			• Lecture/ Discussion
			• Audio Visual
			• Practical Laboratory
				• Direct
				• Observation
				• Written Test
				• Demonstration
				• Oral questioning
					4 Hrs

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
		• Check and quantify item as needed in the job requirement • Apply active and non-active test to ensure functionality.			
	1.2 Install electrical system and auxiliary equipment	• Follow procedure on installation of auxiliary equipment. • Apply proper usage of power tools and equipment in an installation. • Identify types and usage of auxiliary equipment • Practice proper usage of safety harness. • Perform splicing, dressing and harnessing of wires. • Perform termination and mounting of devices. • Perform the installation economically	• Demonstration • Modular (self-paced) • Lecture/ Discussion • Audio Visual • Practical Laboratory	• Direct observation • Written test or examination • Third party report • Demonstration with oral questioning	16 Hrs.
	1.3 Notify completion of work	• Read and familiarize: o Processes, Operations Systems ▪ Maintenance of tools & materials ▪ Storage of tools • Check and conform the installation procedures based on job requirement • Practice good housekeeping • Perform commissioning activities • Document work	• Demonstration • Modular (self-paced) • Lecture/ Discussion • Practical Laboratory	• Direct observation of application of task • Demonstration • Oral questioning	4 hrs
3. Install, assemble, test and maintain motor control system	3.1 Check/ Review type and purpose of motor control system	• Interpret electrical drawing and wiring diagram. • Read and familiarize: o Function of every devices used in the line/ job requirements. o Motor specification for the seclection of control devices. o Type of motor control components & wiring devices o NEMA Standard in mounting of MCC.	• Demonstration • Modular (self-paced) • Lecture/ Discussion • Practical Laboratory	• Direct observation • Written test or examination • Third party report • Demonstration with oral questioning	4 Hrs

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
		• Check and quantify the item needed in the job requirement. • Check the required rating based on its specification in accordance with standard.			
	3.2 Install and assemble motor control system	• Read and familiarize: o Lay-out and dimension of electrical drawing or wiring diagram. o Uses and functions of Electrical motor control devices o Types and operation of motor control system. o Types and uses of termination either point to point termination or terminal strip. o Proper terminal conection of motor leads outs. • Interpret electrical wiring diagram of motor control system • Perform wiring-up on the required electrical control based on the standard. • Perform procedures in connection and termination of motor terminal leads out and control devices. • Perform checking for continuity test or ohmmeter test of motor terminal. • Perform the installation economically.	• Demonstration • Modular (self-paced) • Lecture/ Discussion • Practical Laboratory	• Direct observation of application of tasks. • Oral questioning • Written test or examination • Third party report • Demonstration	16 Hrs
	3.3 Notify completion of work	• Condut performance testing for motor control system • Observe environmental requirements on waste management • Apply 5'S principles • Practice good housekeeping • Perform commissioning activities	• Demonstration • Modular (self-paced) • Lecture/ Discussion • Practical Laboratory	• Direct observation • Written test • Third party report • Demonstration with oral questioning	4 Hrs.

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
	3.4 Maintain electrical motor control system	• Obseve safety practices in the use of PPE, handling of tools, instrument and equipment. • Practice good housekeeping of materials, tools and equipment • Identify types and uses of lubricants and cleaning materials • Apply methods, techniques and procedures in maintenance of motor control system • Practice proper handling of tools, instrument and equipment. • Schedule and perform preventive maintenance • Perform basic troubleshooting skills • Identify failures or defects • Implement corrective and preventive actions based on root cause of trouble.	• Demonstration • Modular (self-paced) • Lecture/ Discussion • Practical Laboratory	• Direct observation of application of tasks. • Oral questioning • Written test or examination • Third party report • Demonstration	12 Hrs