DPEEE2610: Electrical Equipment and Technology

MODULE DETAILS		**Electrical Equipment and Technology DPEEE2610** Nominal duration in hours: 96 This time commitment includes the structured activities, preparation reading, and attendance at each webinar, completing exercises, practical assessments, and proctored assessments. It is also expected that students spend additional time on readings, personal study, independent research, and learning, practicing on remote labs and required software and working on any projects and assignments. This module introduces basic concepts covering ac power and dc power in power generation, electric motors, prime movers, variable speed drives, PLCs and automation, power transmission and distribution, electrical protection and earthing, protection against explosions and lightning, and troubleshooting electrical system faults.	
MODULE PURPOSE		The purpose of this module is for participants to develop broad knowledge of the essential features of power generation, the principles of operation of prime movers, variable speed drives, and PLC's, power transmission, distribution and protection systems, and basic electrical troubleshooting.	
MODIFICATION HISTORY		Rev 4.0	
PREREQUISITE AND/OR CO-REQUISITE MODULES		N/A	
SUMMARY OF LEARNING OUTCOMES		1. Outline fundamental attributes of ac power, dc power and power generation 2. Outline attributes of single-phase power, three-phase power, and prime movers 3. Describe applications, operational parameters, and maintenance requirements of variable speed drives 4. Outline applications, construction, and programming of programmable logic controllers 5. Describe fundamental characteristics of power transmission and distribution systems 6. Outline design requirements for electrical protection and earthing systems 7. Outline requirements for explosion protected equipment and lightning protection 8. Outline basic procedures for troubleshooting electrical systems	
LEARNING OUTCOMES		**ASSESSMENT CRITERIA**	
Learning outcomes specify what students will be able to do as a result of the learning.		Assessment criteria provide the criteria by which achievement of the learning outcomes will be judged.	
1	Outline fundamental attributes of ac power, dc power and power generation	1.1	Compare and contrast basic principles and application of ac and dc power
		1.2	Describe power generation processes in general terms
2	Outline attributes of single-phase power, three-phase power, and prime movers	2.1	Compare and contrast fundamental principles and applications of single and three phase electric power
		2.2	Explain considerations for the operation, maintenance, and selection of single and three phase motors

DPEEE2610: Electrical Equipment and Technology

		2.3	Explain considerations for the operation, maintenance, and selection of prime movers
3	Describe applications, operational parameters, and maintenance requirements of variable speed drives	3.1	Explain the components and operating parameters of variable speed drives (VSD's)
		3.2	Outline the impact of variable speed drives on energy conversion
		3.3	Outline applications and maintenance of VSD's
		3.4	Assess data derived from VSD efficiency calculations
4	Outline applications, construction, and programming of programmable logic controllers	4.1	Explain the fundamental principles and applications of PLC's
		4.2	Interpret a basic PLC ladder program
5	Describe fundamental characteristics of power transmission and distribution systems	5.1	Describe basic technologies and components related to power transmission
		5.2	Explain key attributes of the construction, design, and operation of power distribution systems
		5.3	Explain the concept and relevance of Power Factor in power transmission and distribution
6	Outline design requirements for electrical protection and earthing systems	6.1	Explain typical design and maintenance parameters for protection systems
		6.2	Describe the purpose and methods of earthing protection
7	Outline requirements for explosion protected equipment and lightning protection	7.1	Outline in general terms the processes for identification and classification of hazardous areas
		7.2	Describe protection concepts and techniques related to hazardous areas
		7.3	Outline basic requirements, general Standards and codes of practice related to hazardous areas
		7.4	Identify risks related to lightning and lightning protection
		7.5	Describe broad parameters for the design, installation, and operation of a lightning protection system
8	Outline basic procedures for troubleshooting electrical systems	8.1	Outline types of electrical systems
		8.2	Determine basic fault-finding requirements for electrical installations
		8.3	Describe typical electrical system faults
		8.4	Explain procedures for identifying electrical failures
DELIVERY MODE		Online and/or face-to-face	
SPECIALISED RESOURCES		N/A	

DPEEE2610: Electrical Equipment and Technology

ASSESSMENT STRATEGY	METHODS OF ASSESSMENT
	Assessors must gather a range of evidence that is valid, sufficient, current, and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, structured assessments, samples, and questioning. This will include short answer questions on the knowledge content, the use of remote and virtual labs, and writing tasks to apply the learning to academic tasks. **CONDITIONS OF ASSESSMENT** **Assessor Requirements:** Assessors must satisfy the assessor requirements in the standards for registered training organisations (RTOs) current at the time of assessment. Assessors must also hold a tertiary qualification in engineering or related field. The RTO must also ensure that assessors are able to demonstrate how they keep their industry knowledge up to date through ongoing professional development. The RTO must take appropriate steps, as an ongoing procedure, to verify information about each assessor's qualifications, vocational competencies, and current industry skills. **Assessment Conditions:** Questioning techniques should not require language, literacy, and numeracy skills beyond those required in this module. 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.

DPEEE2610: Electrical Equipment and Technology

	Assessments may be open book assessment and may be completed off campus. Invigilation software will be used for some assessments to ensure authenticity of work completed. Model answers and marking guide must be provided for all knowledge-based assessments to ensure reliability of assessment judgements when marking is undertaken by different assessors.