ADVANCED DIPLOMA OF ELECTRICAL AND INSTRUMENTATION (E&I)
ENGINEERING FOR OIL AND GAS FACILITIES

MODULE DETAILS	**MODULE 18: Programmable Logic Controllers** Nominal duration: 3 weeks (24 hours total time commitment) This time commitment includes the preparation reading, attendance at each webinar (1 hour plus 15-30 minutes for discussion), and the time necessary to complete the assignments and further study.
MODULE PURPOSE	This module is designed to benefit participants with practical, up-to-date information on the application of PLCs to the automation and control of process plants and factories. It is suitable for people who have little or no exposure to PLCs, but who expect to become involved in some or all aspects of PLC installation. It aims to give practical advice from experts in the field, to assist delegates with correctly planning, programming, and installing a PLC with a shorter learning curve and more confidence. While the module is ideal for electricians, technicians and engineers who are new to PLCs, much of the module and additional material in the reading material will be of value to those who already have some basic skills, but need a wider perspective for larger and more challenging tasks ahead.
PRE-REQUISITE MODULES/UNIT(S)	None
ASSESSMENT STRATEGY	To evaluate the achievement of the learning outcomes; written assignments, group projects and practical exercises are set.
SUMMARY OF LEARNING OUTCOMES	1. Explain the fundamentals of PLCs [18.1] 2. Develop simple PLC programs [18.2] 3. Examine and discuss safety controllers, programming standards and communications for PLCs [18.3]

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Learning Outcome 1	**Explain the fundamentals of PLCs**	**[18.1]**
Assessment Criteria	1. Discuss PLCs basics and their applications in general	[18.1.1]
	2. Describe the fundamentals of PLC hardware	[18.1.2]
	3. Describe the fundamentals of PLC software	[18.1.3]
	4. Develop simple digital functions by means of ladder logic	[18.1.4]
	5. Discuss the use of registers (words) in PLC programs	[18.1.5]
Learning Outcome 2	**Develop simple PLC programs for applications**	**[18.2]**
Assessment Criteria	1. Describe good PLC programming habits	[18.2.1]
	2. Outline good installation practice for PLCs	[18.2.2]
	3. Implement advanced control with PLCs	[18.2.3]
	4. Describe the execution of batch process and sequential control using PLCs	[18.2.4]
	5. Examine PID control issues	[18.2.5]
Learning Outcome 3	**Examine and discuss safety controllers, programming standards and communications for PLCs**	**[18.3]**
Assessment Criteria	1. Discuss the essentials of Safety programmable systems	[18.3.1]
	2. Describe the various data communications options for PLCs	[18.3.2]
	3. Describe the basics of IEC 61131-3	[18.3.3]
	4. Examine and discuss the functionality of OPC with regards to PLCs	[18.3.4]
	5. Outline system checkout and testing procedures for PLCs	[18.3.5]

Delivery Mode

A combination of asynchronous and synchronous e-learning delivery comprising a judicious mix of interactive online web conferencing, simulation (virtual labs) software, remote online labs, online videos, Power Points, notes, reading and study materials (in pdf, html and word format) accessed through the Moodle Learning Management System (LMS).