



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

### MODULE DETAILS

#### MODULE 16: Calibration, Installation and Maintenance of Instruments

Nominal duration: 2 weeks (16 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 for engineers and technicians from a wide range of abilities and backgrounds and provides an excellent introduction to installation, calibration, commissioning and maintenance of electronic instrumentation. The module begins with coverage of the basics of electrical measurements. Instrument performance and calibration principles are then covered with rules for calibrating transmitters. Hereafter the procedures for calibrating and installing smart transmitters are covered. Typical documentation requirements for instruments are examined, with a focus on instrument data sheets, P&IDs, and wiring diagrams. During the life span of any plant a multitude of different vendors will supply plant modifications and equipment as the plant is continuously enhanced. The quality of the documentation produced will vary enormously with each new supplier. Instruments in hazardous areas are then detailed. The module is finalised with a discussion on the integration of the entire system, as well as testing and commissioning procedures for instruments.

### PRE-REQUISITE MODULES/UNIT(S)

Module 15: Process Instrumentation

### 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 basics of instrument maintenance and testing [16.1]
2. Examine and discuss the basics of instrument calibration and simulation [16.2]



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**Learning Outcome 1**                      **Explain the basics of instrument maintenance and testing**  
[16.1]

- Assessment Criteria**
1. Explain the overall concepts related to maintenance [16.1.1]
  2. Examine and discuss the instruments and procedures for electrical measurements [16.1.2]
  3. Discuss the attributes of instrument performance [16.1.3]
  4. Discuss instrument documentation and P&IDs [16.1.4]

**Learning Outcome 2**                      **Examine and discuss the basics of instrument calibration and simulation**  
[16.2]

- Assessment Criteria**
1. Discuss the certification, making and approval of instrumentation [16.2.1]
  2. Describe the procedures involved in the calibration of instruments [16.2.2]
  3. Describe the procedures involved in transducer and transmitter simulation [16.2.3]
  4. Describe the procedures involved in the calibration of field bus and digital transmitters [16.2.4]

**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).