TECHNICAL
EDUCATION
ACADEMY

School of Engineering

COURSE PROGRAMME

000371

Flow Measurement in Oil and Gas

Consistent product quality, safety, process optimization and environmental protection – these are only a few reasons why industrial flow measurement is becoming more important all the time.



Learn from the Best in the Business!

Course overview

Intermediate level

Why take this course

Consistent product quality, safety, process optimization and environmental protection – these are only a few reasons why industrial flow measurement is becoming more important all the time. Water, natural gas, steam, mineral oil, chemicals are some of the fluids that have to be measured day in, day out. There is no single, across-the-board technology suitable for all these applications, so you can choose the flowmeter best suited to your process needs from our comprehensive product basket.

The course will endeavor to provide specialist support, introduce sophisticated state of the art monitoring and measurement systems, develop/recommend proper procedures and design standards in line with international bodies to ensure mistakes and/or losses of any kind are alleviated and/or minimized.

Who it is for and how it helps

Mechanical Engineers, Process Engineers, Chemical Engineers, Instrumentation Engineers/ Metering Engineers, Production Engineers, Reservoir Engineers, Valve Technicians, Measurement Superintendents, Custody Technicians, Design Engineers, Hydrocarbon Accountants, Regulators (Government Agencies), Metering System Suppliers.

What you will learn

- Explain the legal and commercial metering requirements
- Explain design criteria and the importance of accuracy
- Apply measurement concepts and types of error
- Apply the basic concepts, the principle of operation, and equipment used for gas metering, liquid metering, proving, and sampling
- Explain the basic concepts, the principle of operation, and hardware used for typical flow computers, prover control micro-computers, and supervisory systems
- Explain the typical operations, control functions, and record-keeping requirements
- Evaluate the results of turbine meter calibration and determine the validity by use of control chart

Curriculum

Modules 01–06

01 Typical Gas System Overview

- Typical Gas Pipeline System
- Role of Operator
- Overview of Typical Gas Sales
- Contracts

02 Typical Gas Metering System Overview

- Introduction to Fiscal Metering
- Pipework and Valving
- Flow Measurement
- Secondary Instrumentation

03 Primary Flow Measurement Instruction

- The Flowmeter
- Meter Tubes and Other Fittings
- Removals/Replacement Procedure

04 Flow Measurement Accuracy

- Flow Measurement Uncertainty
- Rangeability and Calibration
- Calculating Uncertainty
- Traceability

05 Secondary Measurement Instrumentation

- Pressure Measurement
- Temperature Measurement
- Density Measurement

06 Gas Quality Measurement

- The Gas Sampling and Conditioning System

Curriculum

Modules 06–10 · Module 06 — continued

- Relative Density Analyser
- Moisture Analyser

07 Gas Chromatographs

- Introduction to Gas Chromatography
- Gas Conditioning System
- Gas Chromatograph
- Chromatograph Controller
- Calibration and Maintenance

08 Computer System Overview

- Hardware
- Software
- Display Formats
- Alarm Handling and Interpretations
- Response to Input Failures
- Supervisory Computer System
- Hardware and Software
- Operator Interface
- System Security
- Communications

09 Metering Panel Auxillary Equipment

- Analogue to Digital Conversion
- Power Supplies

10 Introduction to Primary Flow Measurement Devices

- Introduction
- Basic Principles of Pipe Flow
- Mathematical Developments

Curriculum

Modules 11–15

11 Differential Pressure Type

- Simple Theory
- Orifice Meters
- Venturi Meters
- Flow Nozzles
- Low Loss Devices
- Variable Orifice Meters
- Variable Area Meters
- Pitot Tubes and Pitot Static Tubes
- Target Flowmeters

12 Displacement Flowmeters

- Basic Principles
- Liquid Meters
- Designs for Gases
- Advantages and Disadvantages
- Applications

13 Rotary Inferential Meters

- Turbine Flowmeters
- Miscellaneous Designs
- Advantages and Disadvantages

14 Fluid Oscillatory Flowmeters

- Principle of Operation
- Vortex Shedders
- Advantages and Disadvantages

15 Electromagnetic Flowmeters

- Principle of Operation

Curriculum

Modules 15–18 · Module 15 — continued

- AC and Pulsed DC Types
- Applications
- Advantages and Disadvantages

16 Ultrasonic Flowmeters

- Doppler Type
- Time-of -Flight Type
- Clamp-on Type
- Applications
- Advantages and Disadvantages

17 Mass Flow Measurement

- Coriolis Flowmeters
- Angular Momentum Devices
- Thermal Meters
- Applications
- Advantages and Disadvantages

18 Miscellaneous

- Cross-Correlation
- Tracer Methods
- Weighing Methods
- Lasers

Participation and contacts

Joining the programme

Contact the Academy and quote course code 000371 to confirm dates, delivery format, prices and enrolment terms.

Training for your team

Tell us your business goals, the roles and number of participants, and your preferred dates and location. This will help us discuss the right training option.

Preparing for the programme

The published programme does not specify any prerequisites. Contact us before enrolling to confirm how to prepare.

Discuss your training needs

mail@tecedu.org
www.tecedu.academy

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