



# AL155: Crude Oil Sampling, Testing, Evaluation



## Training Description:

Crude oil is the single largest traded commodity in the world. Proper sampling, analysis, and reporting of data according to established standards is of paramount importance, especially with the volatility in price, and the market proliferation of synthetic, high TAN, and extra heavy crude oils. Whether crude oil is refined in the near-term or stored for an extended period, it is fundamentally important that recognized procedures and standards be used in sampling and analysis.

This course is designed to provide participants an advanced knowledge on crude oil testing. It covers the crude oil chemistry consisting of physical properties and chemical properties of crude oil, the complexities of crude oil composition, crude oil assays, crude oil specification and marketing. The course will also discuss the main function of oil and gas testing equipment such as UV-visible spectrophotometer, atomic absorption spectrophotometry, gas chromatography, HPLC, ICP and NMR.

At the completion of the course, participants will be able to employ oil and gas sampling procedures; operate testing equipment as per manufacturer procedures; recognize the various international standards applicable to oil and gas tests; carryout equipment handling procedures; implement the basic crude oil tests procedures; identify the major component categories of crude oil and their specifications; analyze test result of GLP and apply result handling procedures, data validation, method validation, uncertainty measurement and reporting procedures.

## Training Objective:

**By the end of the training, participants will be able to:**

- ✓ Apply and gain an advanced knowledge on crude oil testing and equipment
- ✓ Understand the differential between corrosion due to dissolved oxygen, microbiological, CO<sub>2</sub>, H<sub>2</sub>S, etc.
- ✓ Analyze corrosion coupons, corrosion rigs, corrosion probes, etc. and suggest remedial measure for causes of corrosion
- ✓ Understand basic crude oil testing equipment-basic oil chemistry, basic analytical chemistry, IP/ASTM test methods (for crude), interpretation and validation of results
- ✓ Prepare samples for analysis
- ✓ Discuss crude oil chemistry covering the physical properties and chemical properties of crude oil, the complexities of crude oil composition, crude oil assays, crude oil specification and marketing
- ✓ Explain the main functions of oil and gas testing equipment that includes UV-visible spectrophotometer, atomic absorption spectrophotometry, gas chromatography, HPLC, ICP and NMR
- ✓ Employ oil and gas sampling procedures
- ✓ Operate testing equipment as per manufacturer procedures
- ✓ Recognize the various international standards applicable to oil and gas tests comprising of ASTM test methods, other American standards, British standards (BS), other European standards and ISO
- ✓ Carryout equipment handling procedures and implement the basic crude oil tests procedures
- ✓ Identify the major component categories of crude oil and their specifications
- ✓ Analyze the results of GLP and apply result handling procedure, data validation, method validation, uncertainty measurement and reporting procedure





## Training Designed for:

This course is intended for laboratory technicians and other laboratory staff who wants to learn an advanced knowledge on crude oil testing.

## Training Program:

### DAY ONE:

- ❖ PRE-TEST
- ❖ Introduction
- ❖ Crude Oil Chemistry
  - Physical Properties of Crude Oil
  - Chemical Properties of Crude Oil
  - The Complexities of Crude Oil Composition
  - Crude Oil Assays
  - Crude Oil Specification & Marketing
- ❖ The Main Functions of Oil & Gas Testing Equipment
  - UV-Visible Spectrophotometer
  - Atomic Absorption Spectrophotometry
  - Gas Chromatography
  - HPLC
  - ICP
  - NMR

### DAY TWO:

- ❖ Oil & Gas Sampling Procedures
  - Sampling & Sample Handling
  - Representative Sampling & Effect of Sampling Error on Overall Precision
  - Disposal of Completed Samples
  - Reporting of Data and Sample Accountability

### DAY THREE:

- ❖ Operate Testing Equipment as per Manufacturer Procedures
  - UV-Visible Spectrophotometer
  - Atomic Absorption Spectrophotometry
  - Gas Chromatography
  - HPLC
  - ICP
  - NMR
- ❖ International Standards Applicable to Oil & Gas Tests
  - ASTM Test Methods
  - Other American Standards
  - British Standards (BS)
  - Other European Standards
  - ISO





#### DAY FOUR:

- ❖ **Equipment Handling Procedures**
  - Clearing/Resetting Procedures
  - Safe Handling Procedures
  - Preventive Maintenance
  - Other Manufacturer Procedures
- ❖ **Procedures of Basic Crude Oil Test**
  - ASTM Crude Oil Proficiency Testing
  - Standard Test Methods
  - Kinetic Viscosity
  - Vapor Pressure
  - Flash Point
  - Net Heat of Combustion
  - Density
  - Sulphur Contents
  - Boiling Point
  - API Gravity
  - Acidity
  - Other Tests
- ❖ **Practical Sessions**
  - This hands-on, highly-interactive course includes real-life case studies and exercises

#### DAY FIVE:

- ❖ **Major Component Categories of Crude Oil & their Specifications**
  - Gas
  - Gasoline
  - Diesel
  - Kerosene
  - Naphtha
  - Petroleum Coke
  - Other Crude Oil Components
- ❖ **Analyze Test Results**
  - Good Laboratory Practice (GLP)
  - Result Handling Procedure
  - Data Validation
  - Method Validation
  - Uncertainty Measurement
  - Reporting Procedure
- ❖ **Course Conclusion**
- ❖ **POST-TEST and EVALUATION**

#### **Training Requirement:**

“Hand’s on practical sessions, equipment and software will be applied during the course if required and as per the client’s request”.





Please note that the above topics can be amended as per client's learning needs and objectives. Further, it should be forwarded to us a month prior to the course dates.

### Training Methodology:

This interactive training course includes the following training methodologies as a percentage of the total tuition hours:-

- 30% Lectures, Concepts, Role Play
- 70% Workshops & Work Presentations, Techniques, Based on Case Studies & Practical Exercises, Software & General Discussions
- Pre and Post Test

### Training Certificate(s):

Internationally recognized certificate(s) will be issued to each participant who completed the course.

### Training Fees:

**As per the course location** - This rate includes participant's manual, hand-outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Note: The 5% VAT (Value Added Tax), will be effective starting 01<sup>st</sup> of January 2018 as per the new regulation from the UAE Government. The VAT applies for all quotation both for local and abroad.

### Training Timings:

#### Daily Timings:

07:45 - 08:00	Morning Coffee / Tea
08:00 - 10:00	First Session
10:00 - 10:20	Recess (Coffee/Tea/Snacks)
10:20 - 12:20	Second Session
12:20 - 13:30	Recess (Prayer Break & Lunch)
13:30 - 15:00	Last Session

**For training registrations or in-house enquiries, please contact:**

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Training & Career Development Department

