This course provides a comprehensive overview of Oil & Gas field processing technology.

**LEARNING OBJECTIVES**

Upon completion of the course, participants will be able to:
- list main characteristics of Oil & Gas well effluents, assess problems induced by unwanted compounds,
- explain gathering network design and operations,
- detail field treatment of Oil & Gas streams and processes technology,
- grasp fundamentals of Oil & Gas field processing operations and related operating conditions,
- ascertain the treatment processes necessary for production water and injection water.

**WAYS AND MEANS**

Course delivered by industry specialists.
Numerous applications and illustrations.

**LEARNING ASSESSMENT**

Assessment by test at the end of the course.

**PREREQUISITES**

Engineer degree or 2 months of experience in Oil & Gas operations.

**Agenda**

**WELL EFFlUENTS BEHAVIOR**

Different types of well effluent. Main characterization parameters.
Liquid-vapor equilibrium of pure substances and mixtures. Effluent behavior.
Constituents that pose problems for storage, transport or commercialization.
Main specifications to conform with and required treatments.

**FUNDAMENTALS OF RESERVOIR & DRIVE MECHANISM**

Reservoirs: types, exploration techniques.
Drive mechanisms.
Enhanced Oil Recovery (EOR): aim and principle of the main techniques.

**FUNDAMENTALS OF DRILLING, COMPLETION & WELL PERFORMANCE**

Drilling principle. Case of offshore drilling.
Main completion equipment.
Well performance. Needs for artificial lift: principle of artificial lift by pumping, gas lift…
WELL EFFLUENT TRANSPORTATION, FLOW-ASSURANCE & GAS HYDRATES PREVENTION

Gathering network design and operation:
Main flow assurance issues.
Multiphase flow. Flow patterns.
Case studies: gas condensate field development; deep-offshore production.

CRUDE OIL PROCESSING

Crude stabilization by Multi Stage Separation (MSS): election of the number of stages, effect of operating parameters, management of foam issues.
Crude dehydration and desalting. Emulsion treatment: operating parameters, internals, chemicals selection.
Crude sweetening (H_2S removal).
Examples of oil treatment and associated gas compression process schemes.

PRODUCTION & INJECTION WATER TREATMENT

Quality requirements for production water. Environment related constraints.
Main produced water treatments: API oil-water separators, plate separators, flotators, hydrocyclones...
Reasons for water injection.
Quality requirements and necessary treatments: chlorination, filtration, oxygen removal, sulfate removal.
Examples of process schemes for production and injection water treatment.

GAS PROCESSING & CONDITIONING

Gas dehydration: TEG units, solid desiccants (molecular sieves) units.
Gas sweetening. Acid components (H_2S and CO_2) removal: amine units, molecular sieves, membranes.
Natural Gas Liquids (NGL) extraction: use of cryogenic refrigeration, Joule-Thompson expansion, turbo-expander.

LIQUEFIED NATURAL GAS

Fundamentals of Liquefied Natural Gas (LNG) chain.