

# 16PL307 SURFACE PRODUCTION OPERATIONS

Hours Per Week :

L	T	P	C
3	-	-	4

Total Hours :

L	T	P	WA/RA	SSH/HSB	CS	SA	S	BS
45	-	-	20	50	-	5	5	5

## Course Description and Objectives:

The course deals with petroleum level and pressure systems, Field processing of oils, Storage of petroleum and its products, flow measuring equipments and well stimulation technique. Objective of this course is to provide knowledge of production operations in the oil and gas wells.

## Course Outcomes:

The student will be able to :

- understand the basics of oil and gas production engineering techniques
- understand and apply need of stimulation techniques and their types for enhancement in production

## SKILLS:

- ✓ *Able to draw layout of petroleum industry*
- ✓ *Calibration of venturimeter and orifice meter*

**UNIT - 1****L-9**

**Production facilities:** Various types of facilities Controlling the process-Basic system configuration design & selection of facilities: Wellhead and manifold- Separation-Initial separation pressure- Stage Separation, Selection of Stages, Process flow sheets, P&IDs, monitoring well performance testing & optimization of flow.

**UNIT - 2****L-9**

**Two phase liquid and gas separation:** Functional sections of a gas-liquid separator- Inlet diverter section- Liquid collection section- Gravity settling section- Mist extractor section- Equipment description of different separators- Scrubbers- Slug catchers- Selection considerations- Vessel internals- Mist extractors- Potential operating problems.**three phase oil, gas and water separation:** Equipment description- Horizontal separators-Derivation of equation- Free-water knockout- Flow splitter- Horizontal three-phase separator with a liquid "Boot"-Vertical separator.

**UNIT - 3****L-9**

**Crude oil treating:** Equipment description of various treaters and heaters- Indirect and fired heaters- Heater sizing- Vertical heater-treaters- Coalescing media- Horizontal heater treaters-Electrostatic heater-treaters- Oil dehydrators- Emulsion treating theory Agitation- Emulsifying agents- Demulsifiers- Field optimization- Emulsion treating methods.

**Oil desalting systems:** Oil desalting systems-Equipment description of desalters- Mixing equipment- Process description- Single stage desalting- Two stage desalting; Monitoring of oil quality.

**UNIT - 4****L-9**

**Produced water treating systems:** Characteristics of produced water-Sand and other suspended solids- Dissolved gases- Oil in water emulsions- Dissolved oil concentrations- Dispersed oil-Toxicants- Gravity separation- Coalescence- Dispersion- Flotation- Filtration- Equipment description-Retention time and performance considerations-Design of produced water treating systems.Disposal standards- Disposal methods-Offshore & Onshore operations.

**UNIT - 5****L-9**

Storage facilities, measurements custody transfer marketing- transportation modes & dispatch. Gas dehydration compression measurements custody transfer marketing- transportation dispatch. Fire protection systems for tank farm pumping /compressor stations.Water injection facilities, Sources of water, Treatment system, Pumping, Chemical dosing, Identification wells, Patterns of injections well performance monitoring reservoir monitoring.

**TEXT BOOK:**

1. Petroleum and Gas Field Processing, H.K.Abdel-Aal and Mohamed Aggour and M.A. Fahim, Marcel Dekkar Inc., 2003

**REFERENCE BOOK:**

1. Surface Production Operations, Ken Arnold & Maurice Stewart, Vol. 1 & 2, 3<sup>rd</sup> Edition, Gulf Professional Publishing, 2008

**ACTIVITIES:**

- *Design of storage tanks*
- *Develop a control system to control level or pressure.*