A to Z of Oil & Gas to Petrochemicals

Course Facilitator: Dr. U. K. Dutta

The Course is designed for:

1	**Engineers and Consultants from companies in Oil, Gas and Petrochemical sectors,** who want to get a total perspective of the industry from oil well to the petroleum refinery and petrochemical industry and the opportunities it offers.
2	**Managers, Corporate Planners, Finance and HRD personnel from** the hydrocarbon industry, who want to know about upstream and downstream of their facilities.
3	**Graduate Trainees** of a company doing business in the area of oil, gas, refinery and petrochemical industry.

About the Course:

.A brown sticky oil or an explosive gas (natural gas) gets into most of the things we use daily - the clothes we wear, the bags we carry, packets for food in our fast food corner, the steering wheels of our cars, toothbrushes and what not. All of them are produced from the oil and gas that come out from some remote parts of the world. The course walks you through the entire chain starting with oilfield processing to refining and petrochemicals

The course is designed and presented in a manner that it is **appreciated by both technical and non-technical participants.** It starts with simple definitions, concepts and terminologies used in the industry. An animated block diagram is presented showing all the steps or the value chain, starting from the oil well and leading to transportation of oil and gas, the downstream refining and petrochemical industry.

We go further step by step expanding each of the blocks. We cover the technologies, business trends and economics.

A unique program linking the entire hydrocarbon value chain, it is a popular program appreciated by major international companies in South East Asia, USA, Europe and India.

Course Content:

Module No.	TOPIC	DESCRIPTION
Module-1	**Basic Concepts and Terminologies**	▪ What is Petroleum ▪ Origin of oil and natural gas ▪ Brief overview of Petroleum Physics and Chemistry ▪ Industry specific concepts and terminology – API Gravity, Boiling range and cuts, Sweet and sour oil/gas, NGL, LNG, LPG and CNG etc. ▪ Oil, gas and product specifications ▪ Macro-system Diagram – Upstream to Downstream. A series of block diagrams linking the entire chain from oilfield to gas processing, refining and petrochemicals
Module – 2	**Oilfield Processing**	▪ Overview of Exploration ▪ Offshore and onshore field layout and gathering system ▪ Primary production – Gas, oil, water separation, gas dehydration, oil dehydration, produced water treatment, oil and gas dispatch ▪ Secondary and Tertiary production systems ▪ FPSO systems, Deep sea configurations
Module – 3	**Transportation**	▪ Pipeline and marine transportation system ▪ Gas transportation concepts ▪ Typical pipeline configuration ▪ Special engineering features of long distance pipeline system. ▪ Storage and effluents
Module – 4	**Natural Gas Processing**	▪ Why Gas Processing ▪ Overall block diagram of Gas Processing Complex ▪ Gas Dehydration and Sweetening ▪ Cryogenic Gas Processing for LPG, LNG and Petrochemical feedstock production ▪ LNG Cycle - from the source to the consumer ▪ Upstream terminal – Conversion to LNG ▪ Downstream consumer end terminal ▪ Macro-level economics
Module – 5	**Petroleum Refining**	▪ Objectives and history of Refining ▪ Crude characteristics and product specifications ▪ How crude oil is transformed into fuel products like petrol, ATF and diesel. Lube oil production. ▪ Various refinery processing configurations, ▪ Description of distillation, cracking, up-gradation and treatment processes ▪ Petrochemical feedstock production ▪ Utilities and effluents ▪ Major refinery complex examples

		▪ Integration of refinery and petrochemicals plants ▪ Refinery economics overview
Module – 6	**Petrochemicals**	▪ Petrochemical feedstock ▪ Classification of petrochemicals ▪ Base stocks – olefins by steam cracking ▪ Base stocks - aromatics base stocks production ▪ Petrochemical complex ▪ Polymerization - Conversion of base stocks to plastics, synthetic fibers ▪ Examples of major petrochemical complexes ▪ Macro-level economics

Methodology of presentation:

- Power Point presentation converted to html5, supported by most browsers
- Narration on each slide synchronized with animation and script
- Quiz Sessions and practice exercises in each module for better assimilation
- Trainer interaction

Typical Course Benefits:

- Provides you with a refresher on basics and terminologies of oil and gas industry.
- Gives you a total view of the hydrocarbon chain from oilfield to petrochemicals.
- Develops better understanding of the processing steps and technology.
- Develops understanding of macro-level economics, business opportunities and planning aspects. Enhances client interaction and marketing capability.
- Gives understanding of linkages upstream and downstream of your industry.

Course Developer:

Dr. U.K. Dutta is a consultant in the Hydrocarbon Process Industry, focusing on specialist consultancy services and training. Graduate in Chemical Engineering from IIT and Doctorate from Loughborough University of Technology (U.K), he has over 50 years of experience in Hydrocarbon Industry (upstream, midstream and downstream) in the areas of **process and technology, engineering consultancy, project development, marketing and organizational development**. He had work experience and association with major Indian and International companies like EIL, Union Carbide, CE Natco, Lummus Crest, Triune and Rotary Engineering. He has presented papers on Technology Development and Technology Transfer in major International Conferences such as ASCOPE and CHEMTECH.

He has conducted customized training programs for executives of major companies like Petronas (Malaysia), Petrosin (Singapore), Vopak (Singapore), PTT (Thailand), Aker Kvaerner (Singapore), The Yokogawa Group, Technip (India), Ernst & Young, Triune Projects (India), Indian Chamber of Commerce, Solar Turbines (Singapore), Solar Turbines Inc. (San Diego, Brussels) and others. He has conducted several programs for executives in Singapore as a faculty with National University of Singapore's industry training programs.