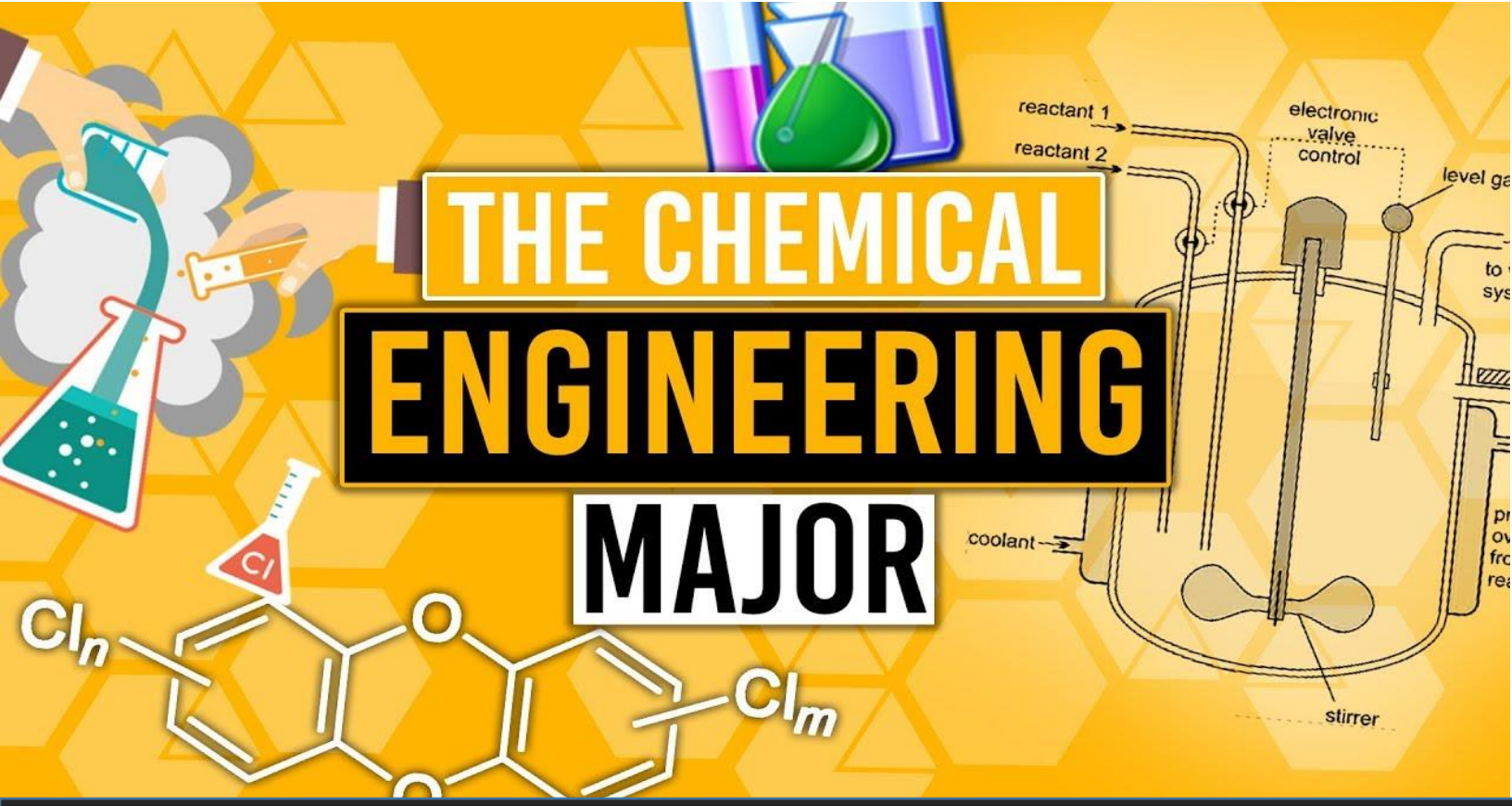

Introduction to Petroleum Engineering

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BTS
Training & Consultancy

Introduction to Petroleum Engineering

Description:

This 5-day course examines engineering challenges and the wider economic impacts (past and present) of oil and gas exploration, drilling and production. Includes a petroleum lab visit, worked examples and plenty of discussion in which participation is encouraged.

Materials Provided:

- Delegates will receive written course notes along with a copy of the power point presentation.
- BTS Consultant Certificate of Attendance will be issued to each delegate upon successful completion of the course.

Target Audience:

The course is intended primarily for those with non-petroleum engineering degree but would serve as a useful refresher to oil industry professionals.

Course Requirement:

A degree in science or mechanical, chemical or civil engineering is desirable.

Contents:

- Global energy (including petroleum) demand and supply.
- Petroleum geology: process of formation and migration of petroleum; suitable geological structure, type and mineralogy of hydrocarbon reservoir rocks.
- Petroleum geophysics: the application of earth's gravitational, magnetic and sound velocity properties in hydrocarbon exploration; 2D, 3D and 4D seismic surveys and their applications explained.
- Formation pressure as the primary energy source of hydrocarbon production
- Production mechanisms: primary, secondary, tertiary; enhanced oil recovery and improved oil recovery.
- Drilling operations: techniques; offshore drilling and directional drilling; rig components (including drilling mud).
- Well logging: application and interpretation of the earth's response to natural and forced electric and nuclear sources.
- Petroleum reserves estimation.
- Well completion techniques: casing, cementing, down hole and surface components; perforation and multiple zone completion.
- Fluid flow in wells: inflow and outflow performance, single- and multi-phase flow regimes, principles of system analysis, well production problems and solutions.

- Operation considerations when retrieving underground physical rock samples and information that can be obtained.
- Reservoir rock properties: porosity, mobility, permeability, relative permeability, capillary pressure; methods of determination.
- Phase behavior, reservoir fluid properties and methods of determination.
- Gas reservoirs: thermodynamic equation of states (including ideal/real gas laws); non-linear (laminar) and non-linear (inertia, turbulent, flow behavior).
- Material balance: initial hydrocarbon in place, future reservoir performance, ultimate recovery calculations.
- Fluid flow through porous media: mathematical and numerical modeling approaches; classification.
- Transient pressure response evaluation by well testing techniques: information obtained, basic assumptions, equations, well productivity and skin calculations.
- History of the industry (economic growth, market control questions), current structure (private actors, public sectors, business models), industry trends (unconventional and IOR), wider issues and "above-ground" risk (resource ownership, future energy needs and alternative energy carriers, climate change).