

UPSTREAM OIL AND GAS

Duration: 1 Day (Usually 8:00 AM - 4:00 PM)

Format: Live or Virtual

This is our most popular course because it is a well-organized, media-rich program that provides solid coverage of the upstream sector in just one day. The course is suitable for beginners but is comprehensive and detailed enough to be engaging for any function or experience level. The format below has a U.S. onshore unconventional focus but can be adjusted to include conventional exploration and development, offshore activities, and/or international forms of minerals contracts. It can also be adjusted to emphasize subjects of interest to particular functional groups or simplified for intern groups. Virtual courses can be conducted to fit any time zone and can be conducted over two half-days upon request.

Course Content

1) Structure of the Industry

- Production Components:
 - Gases (types of gases, characteristics, market uses, wet/dry gas, condensate, contaminants, gas gathering/processing and NGL)
 - Crude Oil (composition, API gravity, sulfur and value) (examination of crude oil specimen in live courses)
 - Oil and gas measurement units
 - Brief description of how gas plants and refineries sort and modify oil and gas molecules
- Sectors of the industry (upstream, midstream and downstream and key activities in each)
- Industry participants (public and private O&G companies, integrated vs. independent, national oil companies, midstream operators and contractors/suppliers)
- US unconventional activities (synopsis of changes brought by unconventional development)
- Current focus of U.S. drilling activities

2) Petroleum Geology and Exploration

- Organic source of oil and gas
- How sedimentary rocks and sedimentary rock basins are formed (examine rock samples with magnifiers in live courses)
- Oil and gas formation, migration and traps
- Differences between conventional vs. unconventional (shale and tight rock)
- Porosity, permeability, and why unconventional development requires horizontal drilling and hydraulic fracturing
- How the earth changes over geological time and why it is important to oil and gas
- The “total petroleum system” (brings it all together and distinguishes tight rock from shale)
- Video overview of exploration methods and tools
- More on seismic (how acquired and 2D vs. 3D)

3) Mineral Rights and Leasing

- Mineral estate ownership in the U.S. vs. other nations
- US mineral estate distribution (private, state and federal ownership)
- Severance of the mineral estate from the surface estate and rights of the mineral estate owner
- Joint mineral estate ownership (multiple owners in the same estate)
- Rule of capture (rights of a mineral estate with respect to oil and gas)
- State regulation of oil and gas activities (including a Texas horizontal well spacing example)
- Why leasing is common and key terms of a lease (bonus, royalty, primary term, etc.)
- Pooling and unitization (why critical with horizontal drilling)
- Brief overview of joint operations

4) Drilling and Completion

- We produced the industry's most-comprehensive drilling video and use several segments that show rig-floor activities as well as animations of down hole activities. Topics covered include:
 - Well planning, design elements, site preparation, and rig mobilization
 - Drill string components and spudding
 - Rig structure and functions (hoisting, rotating and circulating)
 - Casing and cementing
 - Drilling fluids (mud)
 - Directional drilling in the curve and lateral sections
 - Well stimulation, flowback and completion (tubing, packer and Christmas tree)
 - Batch drilling and simul-frac techniques

5) Development and Production Operations

- Example of development economic considerations
- Overview of potential well-evaluation techniques (logging, coring and drill stem tests)
- Overview of artificial lift (may be needed to bring fluid to the surface)
- Processing facilities and animated tour of a modern production site
- Oil and gas reserves