

## Evaluating Shale and Tight Oil & Gas Reservoirs

### Course Description

This 4-day course provides an extensive introduction to the appraisal and development of shale and tight oil & gas reservoirs. It identifies the data that need to be collected, how to analyze and interpret them, and how to integrate and apply this knowledge to the decision-making process. Participants will develop a broad understanding of the practices and pitfalls in assessing these reservoirs, and will reinforce this by analyzing case study posters as teams. Attendees will receive a course notebook and digital reference material.

### Course Outline

1. Introduction
  - a. Definitions, technologies, global potential, commercial aspects
2. Gas Shales and Liquids-Rich Shales
  - a. Geology: Origin, composition, deposition, pore types, natural fractures
  - b. Geochemistry: TOC, Rock-Eval, thermal maturity, sorption, liquids to gas transition
  - c. Geophysics: Geohazards, seismic attributes, microseismic, geomodeling
  - d. Petrophysics: Core analyses, log analyses, integration, practices and pitfalls
  - e. Geomechanics: Static & dynamic properties, stress regimes, planar/complex fractures
  - f. Drilling/Completions: Drilling practices, completion types, environmental concerns
  - g. Well Performance: Flow regimes, empirical methods, reservoir modeling
  - h. Shale Gas Case Studies: Fayetteville, Haynesville, Barnett, Horn River
  - i. Liquids-Rich Shale Case Studies: Eagle Ford, Wolfcamp, Woodford, Marcellus
3. Tight Sandstones and Carbonates
  - a. Geology: Depositional systems, diagenesis, stratigraphy, correlation, res. quality
  - b. Geophysics: Resolving fractures, predicting reservoir heterogeneity & productivity
  - c. Petrophysics: Core analyses, importance of rock fabric, Bakken petrophysical exercise
  - d. Drilling and Completions: Challenges & designs, data analytics, Bone Spring example
  - e. Well Performance: Decline curves, RTA, and simulation applied to Bakken example
  - f. Discrete vs Basin-Centered Accumulations: Characteristics, differentiating them
  - g. Tight Sand Case Studies: Lance, Medina-Clinton, Codell, Cardium
  - h. Tight Carbonate Case Studies: Bakken, Niobrara, Austin Chalk, Jean Marie
4. Coalseam Gas (if desired)
  - a. Origin, lab/log analyses, well performance, drilling/completions, appraisal/develop
5. Project Evaluation Using a Staged Approach
  - a. Importance, workflow/objectives/tactics in each stage, shale assessment exercise

### Who Should Attend

This course is intended for geoscientists, petrophysicists, engineers, and managers who are seeking comprehensive treatment of the technical fundamentals. It is appropriate for those with no previous experience, those with some experience that want to broaden their understanding, and more experienced hands interested in new technologies and practices.

### Recipients of Training

This course has been taught over 100 times in the last 15 years to dozens of companies in open-enrollment courses and customized internal courses.