

N525: Petrophysics Uncovered: a Helpful Guide to Understanding Petrophysics

Instructor(s): Mike Lovell

Format and Duration

Classroom - 1 Day

Virtual - 2 Sessions

Summary

This brief course is intended for the non-specialist. The aim is to explore at an introductory level the role of petrophysics in subsurface exploration and development and to gain an awareness of the importance of petrophysics in subsurface workflows. The focus is on the terminology and vocabulary used by petrophysicists and the course provides a simple overview of how petrophysical properties are determined.

Business Impact: The course is designed to enable **better communication across multidisciplinary teams**, including support staff, through **improved understanding of petrophysical properties and concepts**, thus reducing the likelihood of misunderstanding or unwarranted confusion.

Learning Outcomes

Participants will learn to:

1. Understand the development of petrophysics within the context of the hydrocarbon industry.
2. Appreciate at an elementary level the processes by which hydrocarbons are generated and how they accumulate, and how this impacts petrophysical analysis.
3. Understand the key petrophysical parameters in the static estimation of hydrocarbon volumes, and appreciate how we obtain petrophysical estimates of porosity, saturation, and net to gross.
4. Appreciate the importance and complexity of permeability.
5. Understand how core, downhole logs, and pressure data can provide an integrated petrophysical interpretation.
6. Appreciate the problems involved in scaling petrophysical properties.

Training Method

This is a classroom or virtual classroom course comprising a mixture of lectures and interactive discussions.

Who Should Attend

Anyone who could benefit from an overarching awareness of petrophysics; Geotechs, early career geoscientists, support staff, team leaders or managers looking for an introductory or refresher course.

Course Content

This brief course explores at an introductory level the role of petrophysics in subsurface exploration and reservoir characterization. The course is designed to enable better communication across multidisciplinary teams, including support staff, through improved understanding of petrophysical properties and concepts.

The focus is on the terminology and vocabulary used by petrophysicists, and provides an overview of how

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petrophysical properties are determined. The course provides the historical and spatial context within which petrophysics exists before exploring how petrophysics contributes to determining the volume of hydrocarbons in place.

The course describes in simple terms how porosity, saturation, net to gross, and permeability are determined, how core logs and pressure data can be integrated, and how variations in the scale of measurement in describing the reservoir are important.

Topics to be covered:

- A brief history of the development of petrophysics. Hydrocarbon generation and accumulation and its relevance to petrophysical analysis.
- The hydrocarbon initially in place equation: petrophysical parameters - porosity, water saturation & net to gross.
- Estimation of the petrophysical parameters porosity, water saturation and net to gross.
- Permeability and fluid flow: principles and measurement.
- Integrating petrophysical data: core, downhole logs and pressure data.
- Scaling petrophysical properties; core, log and reservoir scales.