TETRA TECH RPS ENERGY | TRAINING

N422: Reservoir Engineering for Non-Reservoir Engineers

Instructor(s): Jerry Hadwin

Format and Duration
Classroom - 4 Days

Summary

The course presents the fundamentals of reservoir engineering and examines the tasks of the reservoir engineer, with an emphasis on interaction with other disciplines. Principle topics are description of the components of the static reservoir model, development of the dynamic reservoir model, and reservoir management through the life of a field.

This course aims to increase integration and understanding between subsurface disciplines, thereby improving the efficiency, effectiveness, and quality of business activities proposed by the subsurface team.

Learning Outcomes

Participants will learn to:

1. Communicate and work effectively with a reservoir engineer.
2. Determine the key parameters of reservoir fluids and how the fluids are sampled, measured, and described.
3. Identify fluid distribution in a reservoir, including contacts and pressure relationships.
4. Evaluate reserve and resource volumes and describe tools such as decline curve analysis and material balance that can influence the estimates.
5. Perform simple interpretations of well test data and demonstrate what can be learned from the data.
6. Analyze reservoir drive mechanisms.
7. Outline the benefits and limitations of reservoir simulation in a variety of settings.
8. Determine appropriate reservoir surveillance practices to implement during the life of a field.
9. Distinguish which enhanced oil recovery techniques might be suitable for a particular field.

Training Method

This is a classroom or virtual classroom course comprising a mixture of lectures, discussion, case studies, and practical exercises.

Who Should Attend

This course is designed for professionals who work with, or rely on, analyses provided by reservoir engineers, or who otherwise need to understand and communicate with them on a technical or commercial basis.

Participants should have some familiarity with the concepts of reservoir engineering and field development, but require a greater understanding of the data used and the techniques employed by the reservoir engineer in day-to-day work. It is suitable for exploration, development and production geoscientists as well as petrophysicists, facility and operations engineers, drilling and production engineers, pipeline engineers, and business analysts. Early career Reservoir Engineers could also find this course beneficial.

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Course Content

The course provides an understanding of the underlying value and limitations of the analyses provided by reservoir engineers, as well as a better understanding of the required data and assumptions involved in the practice of reservoir engineering. Participants will obtain an understanding of routine reservoir engineering calculations, the data required to perform these calculations, the primary tools and techniques used by reservoir engineers, and the information gained by the application of those techniques. The limitations of the extrapolation of the results to the decision making process will also be covered. Throughout the course, the impact of the data, assumptions and technical limitations are related to the economic impact they have on reservoir management.

Day 1

- Reservoir geological description and rock properties
- Hydrocarbon phase behavior including example PVT Studies

Day 2

- Fluid and pressures distributions including pressure vs. depth and capillary pressure
- Volumetric reserve estimates including examples, reserve classifications, probabilistic reserve estimates
- Fluid flow (Darcy's Law) and well inflow

Day 3

- Well testing, pressure transient analysis methods including buildup curve examples
- Gas well testing and AOF analysis
- Vertical lift (tubing) performance and artificial lift
- Reservoir drive mechanisms, material balance and fluid displacement
- Gas reservoirs and P/Z diagrams

Day 4

- Reservoir monitoring
- Simulation
- Production forecasting
- Enhanced oil recovery