



## Decline Curve Analysis and Diagnostic Methods for Performance Forecasting - DCA

### COURSE

#### About the Course

Decline curve analysis has been called the most commonly used and misused technique for forecasting future production and remaining reserves. This course will give the learner a better understanding of how fundamental reservoir properties and drive mechanisms affect the shape of the production decline curve and how to avoid many of the mistakes commonly found in decline curve forecasts. The course also examines the use of modern production decline type-curves to evaluate reservoir properties and predict future performance. One personal computer is provided, at additional cost, for each two participants.

This course covers both conventional and unconventional reservoirs.

*"Everything was important."* - Reserves Analyst, Angola

*"The format that the information was presented was highly effective."* - Reservoir Engineer, United States

#### Target Audience

Engineers or technical assistants who are responsible for making forecasts of future production using decline curves analysis. Economists, managers, or geoscientists who are interested in developing a greater working knowledge of decline curve methods and how to make better forecasts will also benefit from this course.

#### You Will Learn

Participants will learn how to:

- Use the exponential, hyperbolic and harmonic decline curve equations
- See the relationships between reservoir recovery mechanisms and decline curve types
- Identify and understand how the transient flow period can lead to an overestimation of reserves
- Use multiple methods to avoid overestimating reserves
- Recognize reservoir performance characteristics based on actual field examples
- See the impact of reservoir heterogeneities such as faulting, permeability variance, and layering
- Account for changing operating conditions
- Perform analysis on a multi-well basis without introducing common errors
- Use alternative methods including diagnostic performance plots (e.g., log WOR vs.  $N_p$ , Stagg's, P/Z vs.  $G_p$ , etc.) for rate and reserves analysis

- Use advanced decline curve and production data analysis for reservoir characterization: flow regime, hydrocarbons-in-place, permeability, skin, drainage area, fracture properties, etc.

## Course Content

- Conventional decline curve equations: exponential, hyperbolic and harmonic rate versus time and rate versus cumulative production relationships, selecting the proper equation based on reservoir properties and drive mechanisms
- The effects of transient production: how to recognize transient production, how transient forecasts can overestimate remaining reserves, how to properly constrain transient forecasts
- Forecasting during displacement processes: using trends like water-oil ratio and versus cumulative oil production to estimate ultimate oil recovery, converting these trends into an oil rate versus time forecast
- Difficult situations: layered and compartmented reservoirs, downtime, workovers, changing facility conditions and facility constraints, forecasting groups of wells, common mistakes
- Production decline type-curves: introduction and historical background, how to use modern Fetkovich type-curves for forecasting production
- Brief discussion of unconventional gas/oil reservoir decline analysis and production forecast

## Product Details

Categories: [Upstream](#)

Disciplines: [Reservoir Engineering](#)

Levels: [Specialized](#)

Product Type: [Course](#)

Formats Available: [In-Classroom](#)

Instructors: [PetroSkills Specialist](#) [Richard Henry](#)