

Module 5: Reservoir Engineering

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Description

This week covers the basic principles of reservoir engineering and management. Reservoir characterization methods are presented as well as the elements of managing the resource. Individual topics will include the fundamentals of reservoir properties and flow mechanisms, the analysis of well measurements and the estimation of well performance characteristics. The course will also look in detail at reservoir modeling, reservoir simulation and the design and management of reinjection.

Outline

1. Volumetrics
 - a. Thermodynamics of rock/water/steam systems
 - b. Properties of two-phase mixtures (ct and m)
 - c. Flow of fluids in porous and fractured media
2. Wellbore calculations
 - a. Wellbore heat loss
 - b. Wellbore pressure loss
 - c. Analysis of pressure, temperature and spinner logs
3. Well test analysis
 - a. Pressure drawdown and buildup interpretation
 - b. Interference testing
 - c. Injectivity testing
 - d. Testing and equipment
 - e. Analysis of fracture treatments in EGS
4. Decline curve analysis
 - a. Single-phase reservoirs
 - b. Two-phase reservoir
5. Reservoir simulation
 - a. Volumetrics
 - b. History matching (p, h, c)
 - c. Stability, errors, gridding and time stepping
6. Reinjection
 - a. Effects of injection
 - b. Tracer testing (design and analysis)
 - c. Worldwide field experiences