

Applied Reservoir Simulation

Brief Course Schedule

Day 1	Introduction. Classical analysis. Reservoir simulation overview. Characterizing the reservoir. Benefits of reservoir simulation. Formulation of equations. Linearization & solution process. Minimum data requirements. Well calculations.
Day 2	Data preparation. Introduction. Porosity. Permeability, relative permeability, capillary pressure. Hysteresis. Fluid Properties - PVT. History matching.
Day 3	Fine grid simulations. Introduction. Single well studies. Cross-sectional models. Areal models. Grid orientation. Layering. Cell properties - shales & sands. Vertical equilibrium. Pseudofunctions. Scale-up procedures.
Day 4	Coarse grid models. Simulation grids. Local grid refinements. Modeling faults. Rock, block, and well properties in a coarse grid. Aquifers. Fractured reservoir simulation. Simulation walkthrough.
Day 5	Overview of simulation process. Conducting a study. Overview of compositional simulation.

Brief Course Description

Theory and practice of reservoir simulation; the development of simulation programs, selection of the proper model for a simulation study, data preparation and grid design, calibration of the reservoir model using observed performance data, forecasting of future performance under primary and secondary recovery schemes, and interpretation of simulation results. Advanced topics, including pseudo-relative permeability and capillary pressure, are also discussed; understanding the role of simulation in reservoir management, the mechanics of reservoir simulation, limitations & structural aspects of the models, upscaling and simulation techniques. ECLIPSE 100 will be utilized during the tutorials but prior experience with ECLIPSE is not required.

Intended Audience

- Engineers, geologists, geophysicists, managers, and other oilfield technical staff

Topics Covered

- Fundamentals of reservoir simulation
- Simulation equations
- Finite approximations
- Single and multiple dimensions
- Single and multiple phases
- Solution methods
- Well calculations
- Types of models
- Black oil