JUPITER PRIME

Consulting • Training • Advisory

جوبيتر برايم للاستشارات والتدريب

COURSE BROCHURE

# Rock Wettability and Capillary Pressure Training Course

5 – 9 July 2027
Geneva

**jupiterprime.uk**

info@jupiterprime.uk

Registered in the United Kingdom and Saudi Arabia

# Rock Wettability and Capillary Pressure Training Course

**Ref:** 2870_109714 **Date:** 5 – 9 July 2027 **Location:** Geneva **Fees:** 7500 GBP

Rock Wettability and Capillary Pressure is a 1-week training course for geoscientists and reservoir engineers new to rock and fluid properties, built around a rock property data sheet for a reservoir zone. Mature fields, injection schemes and storage projects all depend on how oil, gas and water share pore space, so weak rock-fluid inputs now distort recovery forecasts. Jupiter Prime Training presents this course to connect laboratory and log evidence with the numbers reservoir models need.

## Why Rock Wettability and Capillary Pressure Matters Now

Three groups lean on rock-fluid properties more heavily than before. Field development planners need defensible residual oil and connate water values to rank waterflood, gas injection and chemical recovery options. Simulation specialists ask for relative permeability and capillary curves that honour both core plugs and log-derived saturations. Carbon storage and gas storage teams rely on the same capillary entry pressures to judge seal capacity and trapped volumes. The course draws on recognised laboratory practice for routine and special core measurements and on established petrophysical interpretation methods.

## Who Gains Most from Rock Wettability and Capillary Pressure

- Geoscientists who describe pore systems, rock types and their distribution across a zone
- Reservoir engineers who prepare saturation functions and flow inputs for simulation
- Petrophysicists who reconcile log saturations with core-derived capillary data
- Laboratory liaison staff who scope plug selection and test sequences
- Storage and injection engineers who assess entry pressure and trapping behaviour

Subsurface teams that send a geoscientist and a reservoir engineer from the same asset gain most.

## Rock Wettability and Capillary Pressure Capabilities

Participants turn plug measurements and log curves into flow functions a simulator can use with confidence.

- Assess porosity and permeability quality from plugs and logs — rock type definitions
- Calculate water saturation from resistivity logs — volumetric estimates
- Apply mercury injection, centrifuge and porous plate results to describe pore throat distributions — rock typing
- Weigh contact angle, imbibition and wettability index evidence to classify a reservoir's wetting state — recovery method selection
- Build normalised relative permeability and capillary curves for each rock type — simulation model inputs
- Communicate property uncertainty ranges to planners and storage teams — development and injection decisions

## Key Rock Wettability and Capillary Pressure Terms

- Wettability — The tendency of one fluid to spread on or adhere to a rock surface in the presence of another fluid.
- Capillary pressure — The pressure difference across the interface between two immiscible fluids in a pore.
- Free water level — The depth at which capillary pressure between oil and water is zero.
- Irreducible water saturation — The lowest water saturation reachable by displacement.
- Relative permeability — The ability of a rock to pass one fluid when other fluids also occupy the pores.
- Residual oil saturation — The oil left trapped in pores after displacement by water or gas.

## Rock Wettability and Capillary Pressure Day by Day

### Day 1: Pore Systems and Fluid Distribution

- Pore Geometry and Throat Size — How Rock Fabric Controls Fluid Placement
- Porosity Measurement Routes — Helium, Saturation and Log-Derived Values Compared
- Permeability From Plugs and Probes — Selecting Representative Values for a Zone
- Interfacial Tension and Contact Angle — Physical Basis of Capillary Forces
- Rock-Fluid Inputs in Field Plans — Where Errors Shift Recovery Forecasts

### Day 2: Capillary Pressure Measurement and Interpretation

- Mercury Injection Capillary Pressure — Deriving Pore Throat Distributions and Entry Pressure
- Porous Plate and Centrifuge Methods — Choosing Tests for Drainage and Imbibition
- Laboratory to Reservoir Conversion — Correcting Fluid Pairs, Tension and Angle
- Dimensionless Capillary Normalisation — Combining Plugs of Different Quality
- Free Water Level Placement — Linking Capillary Curves to Pressure Gradients

### Day 3: Wettability Evidence and Its Effects

- Imbibition and Displacement Index Tests — Measuring Spontaneous and Forced Uptake
- Contact Angle and Ageing Protocols — Restoring Native State Before Testing
- Mixed and Oil-Wet Behaviour — Consequences for Waterflood Sweep and Residual Oil
- Resistivity Index and Saturation Exponent — Wettability Effects on Log Saturation
- Low Salinity and Chemical Alteration — Screening Wettability Change Options

### Day 4: Flow Functions for Reservoir Models

- Steady and Unsteady-State Relative Permeability — Test Choice and Data Quality
- Endpoint Saturations and Curve Shapes — Power-Law Fitting for Simulation Tables
- Rock Typing by Pore Throat Class — Assigning Saturation Functions Across a Grid
- Saturation Profiles From Logs Versus Core — Reconciling Two Independent Estimates
- Entry Pressure for Seals and Storage — Judging Column Height and Trapped Volume

## Day 5: Practising the Rock Property Data Sheet

- Plug Data Screening Exercise — Rejecting Damaged or Unrepresentative Samples
- Capillary Curve Conversion Drill — From Mercury Data to Reservoir Conditions
- Wettability Classification Case — Choosing a Wetting State From Mixed Evidence
- Relative Permeability Table Build — Normalised Curves for Two Rock Types
- Rock Property Data Sheet — Assembling Porosity, Permeability, Saturation and Flow Inputs

## Applying Rock Wettability and Capillary Pressure After the Course

- Audit the saturation functions in one active simulation model, checking that each rock type uses converted capillary curves and consistent endpoints.
- Draft a special core test request for the next cored well, specifying plug selection, ageing and wettability measurements.

## Rock Wettability and Capillary Pressure Questions FAQ

### What is rock wettability and capillary pressure, and why does it matter now?

It is the study of how fluids share and move through pore space. It matters now because injection, recovery and storage decisions rely on saturation and flow inputs that come directly from these properties.

### Which roles gain most from rock wettability and capillary pressure skills?

Geoscientists and reservoir engineers early in their subsurface careers gain most.

### How does rock wettability and capillary pressure differ from a routine core analysis course?

It concentrates on rock-fluid interaction rather than on core handling and basic plug measurements, turning special test results into flow functions for models.

### What will you bring back from rock wettability and capillary pressure?

You bring back a rock property data sheet for one reservoir zone. It lists screened properties, a wetting state and flow curves.

## Rock Wettability and Capillary Pressure: The Way Forward

The rock property data sheet first informs which saturation functions a reservoir model should carry for each rock type. Reservoir engineers, geoscientists and simulation specialists use it when initialising and history matching models. After its first use, revisit the wettability classification, as new ageing tests often change the curves.