

**PRODUCTION SYSTEM MODELLING USING "PROSPER"**

**Detailed Course Contents**

**Day 1**

Morning (08:30-12:30)

1. Introduction to Production System Modelling
  - a. Completion Design
  - b. Production Optimisation
  - c. Modelling Method
  - d. Overview of PROSPER and resources supplied with the software
2. PVT Properties of Fluids
  - a. Hydrocarbon Fluid Types & Phase Diagrams
  - b. Black Oil vs. Compositional
  - c. Black Oil Correlation Selection & Tuning / Importance of Viscosity
  - d. Working with Lab Reports / Differential vs. Flash vs. Multi-stage

Afternoon (13:30 – 17:30)

3. Inflow Performance Relationships
  - a. Straight Line PI vs. Vogel
  - b. Darcy vs. Forchheimer (rate dependent skin) and others
  - c. Oil & Gas Model selection
  - d. Horizontal Well Modelling /pressure loss along wellbore
  - e. Multilateral Well modelling
4. Well Skin & Damage Modelling & Design Optimisation
  - a. Skin Definition, Types & Origin
  - b. Perforation modelling & design / spf & in-situ penetration
  - c. Gravel Pack modelling & design
  - d. Stimulation modelling & design

## **Day 2**

### Morning (08:30-12:30)

5. Vertical Lift Performance
  - a. Multi-phase Flow
  - b. MPF Correlation Selection & tuning
  - c. Surface Roughness & Erosional Velocity
  - d. Turner Velocity and Sand Particle Transport
6. Tubing Size Selection
  - a. Life of Well Sensitivities
  - b. Tubing Equipment
  - c. Stable Rates
  - d. Velocity Strings & Insert Gas Lift Strings

### Afternoon (13:30 – 17:30)

7. Detailed Nodal Analysis Options & Solutions Review
  - a. Matching Real Field Data for Performance Prediction and Network Optimisation
  - b. Enthalpy Balance Temperature Prediction
  - c. Gas Lift Injection Line and Subsea Flowline Modelling
  - d. Plotting & Reporting
  - e. OpenServer Automation
8. Artificial Lift
  - a. Gas Lift Rate & Depth of Injection Optimisation
  - b. Gas Lift Design & Troubleshooting Options (Basic Introduction)
  - c. ESP Design (Basic Introduction)
  - d. Other Lift Methods

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