



*Petrel Uncertainty Analysis and Optimization  
Fundamentals*

*Cairo - InterContinental Cairo Semiramis*

*15-11-2026*

# Petrel Uncertainty Analysis and Optimization Fundamentals

Course code: SC388 From: 15-11-2026 Venue: Cairo - InterContinental Cairo Semiramis Course Fees: 3100 £

## Introduction

Reservoir management in the oil and gas industry is a complex and dynamic process that requires the integration of geological, geophysical, and engineering data. Petrel, a leading software platform, offers powerful tools for reservoir modeling, but harnessing its full potential requires a deep understanding of uncertainty analysis and optimization fundamentals.

Our 5-day training program is designed to equip professionals with the knowledge and skills necessary to effectively use Petrel for uncertainty analysis and optimization in reservoir management. Whether you are a reservoir engineer, geologist, or geophysicist, this program will provide you with the expertise needed to make informed decisions in reservoir development and production.

## Course Objectives

By the end of this training program, participants will be able to:

- Master Petrel Essentials: Gain proficiency in Petrel software, from basic navigation to advanced modeling techniques, enabling efficient project setup and data manipulation.
- Understand Uncertainty Analysis: Comprehend the concept of uncertainty in reservoir modeling, identify sources of uncertainty, and implement various uncertainty quantification methods.
- Stochastic Modeling: Learn how to create stochastic realizations of geological models, define property distribution functions, and understand geostatistical techniques.
- Sensitivity Analysis: Perform sensitivity studies in Petrel, identify critical parameters, and interpret sensitivity results to make informed decisions.
- Optimization Fundamentals: Understand the fundamentals of optimization, define objectives and constraints, and set up optimization problems within Petrel.
- Integrated Workflow: Develop integrated workflows that combine uncertainty analysis with optimization to optimize reservoir development strategies.
- Advanced Techniques: Explore advanced uncertainty analysis and optimization techniques for complex geological scenarios and real-time reservoir management.
- Case Studies: Analyze real-world case studies to apply the knowledge gained during the training program to practical reservoir management scenarios.

## Target Audience

This training program is designed for professionals working in the oil and gas industry who are involved in reservoir management and modeling. The target audience includes:

- Reservoir Engineers
- Geologists
- Geophysicists
- Petrophysicists
- Reservoir Simulation Specialists
- Asset Managers
- Data Analysts
- Any professional involved in the exploration, development, or production of hydrocarbon reservoirs

## Course Outlines

### Day 1

#### Introduction to Petrel and Uncertainty Analysis

- Introduction to Petrel
  - Overview of Petrel software
  - Interface and navigation
  - Basic data import and project setup
- Geological Modeling Basics
  - Creating geological models
  - Fault modeling and gridding
  - Property modeling techniques
- Introduction to Uncertainty Analysis
  - Understanding uncertainty in reservoir modeling
  - Types of uncertainty: geological, geophysical, and engineering
  - Uncertainty quantification methods

### Day 2

#### Uncertainty Analysis in Petrel

- Stochastic Modeling in Petrel
  - Overview of stochastic modeling
  - Building stochastic realizations
  - Property distribution functions
- Geostatistics in Petrel
  - Introduction to geostatistics
  - Variogram modeling
  - Kriging and simulation
- Sensitivity Analysis
  - Identifying critical parameters
  - Running sensitivity studies
  - Analyzing results

## Day 3

### Optimization Fundamentals

- Introduction to Optimization
  - Optimization in reservoir management
  - Types of optimization problems
  - Optimization objectives and constraints
- Setting Up Optimization Problems in Petrel
  - Defining objectives and constraints
  - Choosing optimization variables

## Day 4

### Performing Uncertainty Analysis with Optimization

- Integrated Uncertainty and Optimization Workflows
  - Combining uncertainty analysis with optimization
  - Workflow design and considerations

- Case Studies
  - Practical examples of uncertainty analysis and optimization in Petrel
  - Analyzing real-world reservoir data

## Day 5

### Advanced Topics and Application

- Advanced Uncertainty Analysis Techniques
  - Advanced stochastic modeling methods
  - Handling complex geological scenarios
  - Advanced sensitivity analysis techniques
- Real-Time Reservoir Management and Optimization
  - Introduction to real-time optimization
  - Using Petrel for ongoing reservoir management
  - Case studies and best practices
- Course Conclusion and Q&A
  - Review of key concepts
  - Open floor for participant questions and discussion
  - Course evaluation and feedback