Special Courses · SC388

Petrel Uncertainty Analysis and Optimization Fundamentals

Istanbul · 27 - 31 Dec 2026

Date	Venue	Duration
27 - 31 Dec 2026	**Istanbul**	**1 Week**
Fee	Ref	Language
£5,400 GBP	**SC388**	**English**

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

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