



OIL AND GAS

Probabilistic Risk Assessment & Decision Analysis in Petroleum Projects

Course code: OG-011

SPARK TRAINING

Professional training courses for leaders, specialists, and organizations seeking practical capability development.

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— Workshop Overview

Petroleum projects involve significant capital investment, technical uncertainty, and exposure to market and operational risks. Traditional deterministic approaches often fall short in capturing the full range of possible outcomes. This course introduces structured probabilistic techniques that enable professionals to quantify uncertainty, evaluate risk exposure, and make informed decisions. Participants will learn how to apply risk-based thinking to exploration, development, and production projects, improving both financial performance and operational resilience.

Why Attend

The course combines practical learning with applied techniques through:

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Real-world case studies from upstream, midstream, and downstream projects

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Hands-on exercises in probabilistic risk assessment

Who Should Attend

Petroleum Engineers and Project Engineers

Project Managers in oil & gas projects

Risk and Reliability Engineers

Planning and Cost Control Professionals

Financial Analysts and Investment Decision-Makers

Professionals involved in exploration,

— Learning Objectives

- Apply probabilistic methods to assess project risks
- Model uncertainty using appropriate statistical distributions
- Perform risk-based evaluations of petroleum projects
- Use decision analysis tools to compare project alternatives
- Interpret results from quantitative risk models
- Integrate probabilistic analysis into project planning and investment decisions

— Course Outline

DAY 1

Fundamentals of Probabilistic Risk in Petroleum Projects

- Overview of risk in exploration, development, and production
- Deterministic vs. probabilistic approaches
- Types of risks: subsurface, technical, economic, operational
- Risk identification techniques and structuring uncertainty
- Building a petroleum project risk register
- Introduction to probability concepts and distributions

DAY 2

Quantitative Risk Assessment Techniques

- Statistical foundations for probabilistic analysis
- Defining input variables and uncertainty ranges
- Probability distributions (normal, lognormal, triangular, etc.)
- Sensitivity analysis and key risk drivers
- Introduction to Monte Carlo simulation concepts
- Practical exercises in quantitative risk modeling

DAY 3

Decision Analysis for Petroleum Investments

- Decision-making frameworks in oil & gas
- Decision trees and expected monetary value (EMV)
- Risk vs. reward trade-offs in petroleum projects
- Portfolio decision-making concepts
- Value of information in exploration decisions
- Case study: Drilling investment evaluation

DAY 4

Integrated Cost, Schedule & Production Risk Modeling

- Linking cost, schedule, and production uncertainties
- Modeling dependencies and correlations
- Production forecasting under uncertainty
- Scenario planning and stress testing
- Risk mitigation strategies and optimization
- Tools and software overview (conceptual)

DAY

5

Risk-Based Decision Making & Project Optimization

- Embedding probabilistic analysis into project lifecycle
- Risk-informed planning and budgeting
- Communicating probabilistic results to stakeholders
- Governance and reporting of risk in petroleum projects
- Industry best practices and lessons learned
- Final group case study and presentations

— Upcoming Classroom Dates

DATE	LOCATION	FEE
5 - 9 October 2026	Barcelona - Spain	€1,925
16 - 20 November 2026	Paris - France	€2,250
7 - 11 December 2026	Munich - Germany	€2,125
21 - 25 December 2026	Barcelona - Spain	€2,125
11 - 15 January 2027	Amsterdam - Netherlands	€2,125
8 - 12 February 2027	London - United Kingdom	€2,100
8 - 12 March 2027	Munich - Germany	€2,125
12 - 16 April 2027	Cape Town - South Africa	€2,125

— Certificate and Registration

Participants who attend and complete the full programme receive a SPARK Training Certificate of Completion. For registration, in-house delivery, or availability questions, contact info@sparktraining.eu or +31 85 115 0004.