aractech

Global Learning for Operational Leaders

OIL AND GAS | OG-011

Probabilistic Risk Assessment & Decision Analysis in Petroleum Projects

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Course content

Why Attend

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.

Course Methodology

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

• Hands-on exercises in probabilistic risk assessment

• Group discussions and scenario-based simulations

• Step-by-step demonstrations of decision analysis tools

• Practical frameworks for immediate workplace application

Course 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

Target Audience

• This program is designed for:

• Petroleum Engineers and Project Engineers

• Project Managers in oil & gas projects

- Risk and Reliability Engineers

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Course outline

Detailed course outline

Day-by-day outline for Probabilistic Risk Assessment & Decision Analysis in Petroleum Projects.

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

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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)

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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

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Seminar dates

Available seminar dates

Live dates and pricing for Probabilistic Risk Assessment & Decision Analysis in Petroleum Projects generated from the course details page.

Date	Location	Format	Fee
11 - 15 May 2026	Munich	Classroom	**€2,415**
8 - 12 June 2026	Amsterdam	Classroom	**€2,975**
6 - 10 July 2026	London	Classroom	**€2,940**
10 - 14 August 2026	Munich	Classroom	**€2,415**
31 August - 4 September 2026	Barcelona	Classroom	**€2,695**
5 - 9 October 2026	Barcelona	Classroom	**€2,695**
16 - 20 November 2026	Paris	Classroom	**€3,150**

Live online option	Online delivery is available at €1,250.