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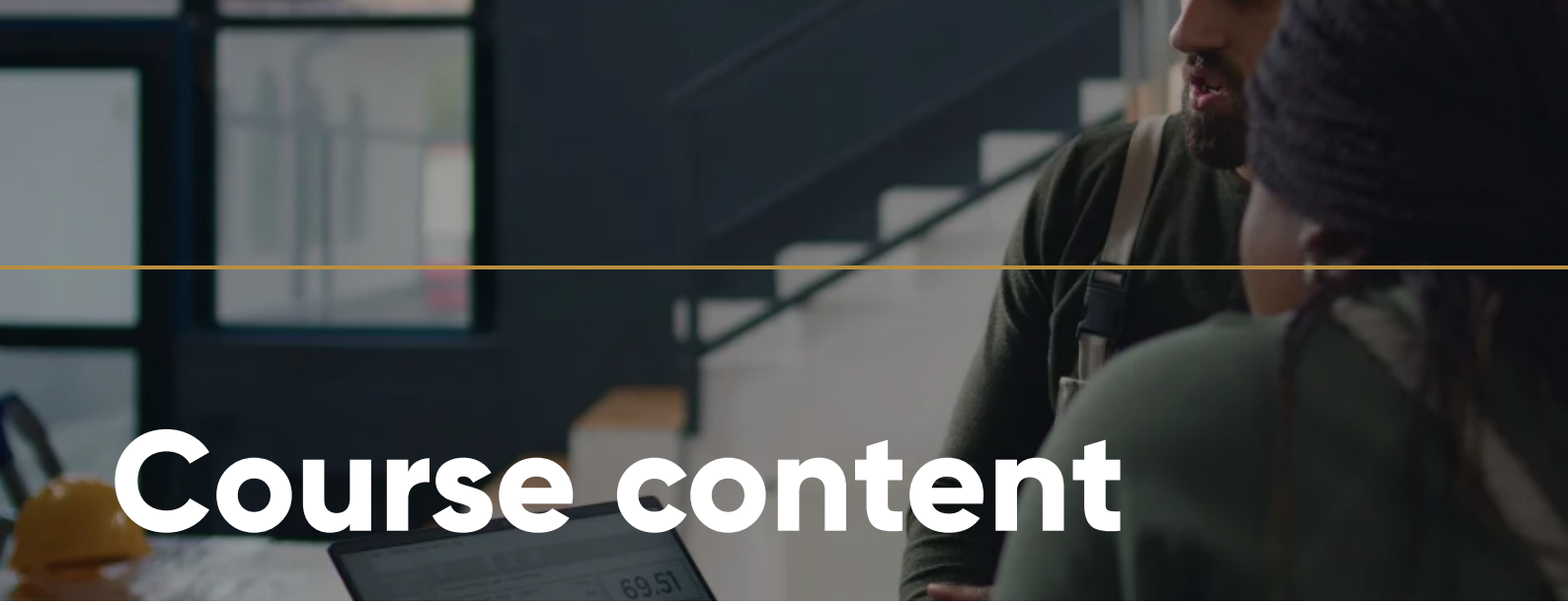
OIL AND GAS | OG-011

Probabilistic Risk Assessment & Decision Analysis in Petroleum Projects

UK
+44 33 000 111 90
info@informatech.co.uk
https://informatech.uk
63-66 Hatton Garden Hatton Garden
EC1N 8LE , London

NL
+31 85 74 444 46
info@infomatech.nl
https://infomatech.nl
Waarderweg 50 - 2031PB
Haarlem - Netherlands



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

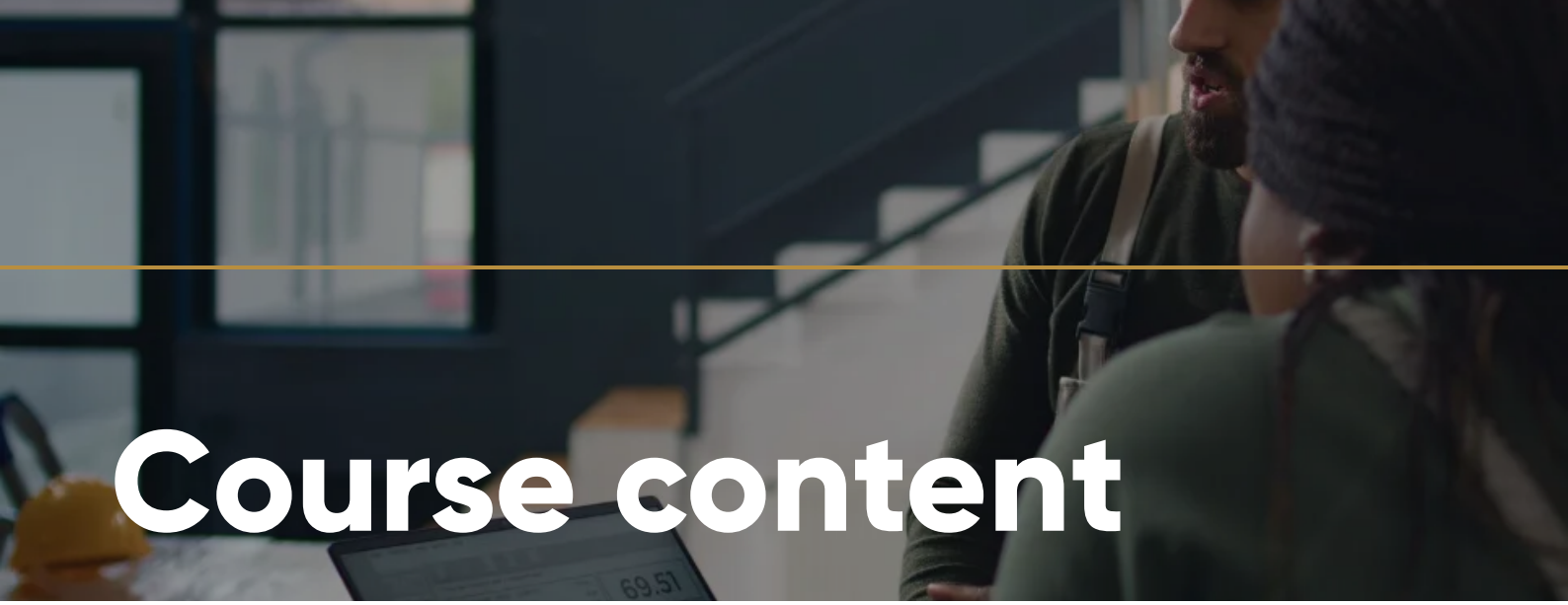
The course combines practical learning with applied techniques through:

- 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

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

- 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



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Target Audience

This program is designed for:

- 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, development, and production

Target Competencies

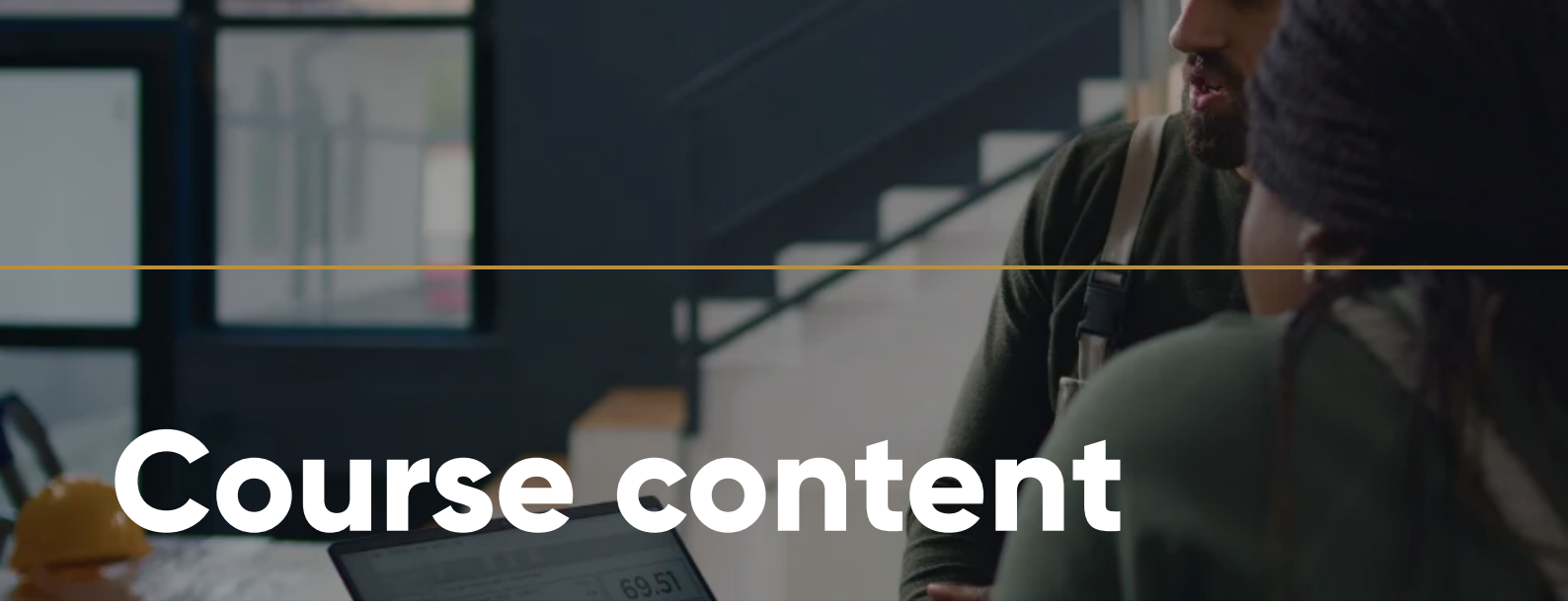
Participants will develop the following competencies:

- Probabilistic risk assessment (PRA)
- Quantitative modeling and analysis
- Decision analysis under uncertainty
- Scenario evaluation and forecasting
- Risk-informed investment decision-making
- Communication of risk and uncertainty insights

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



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Course outline

• 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

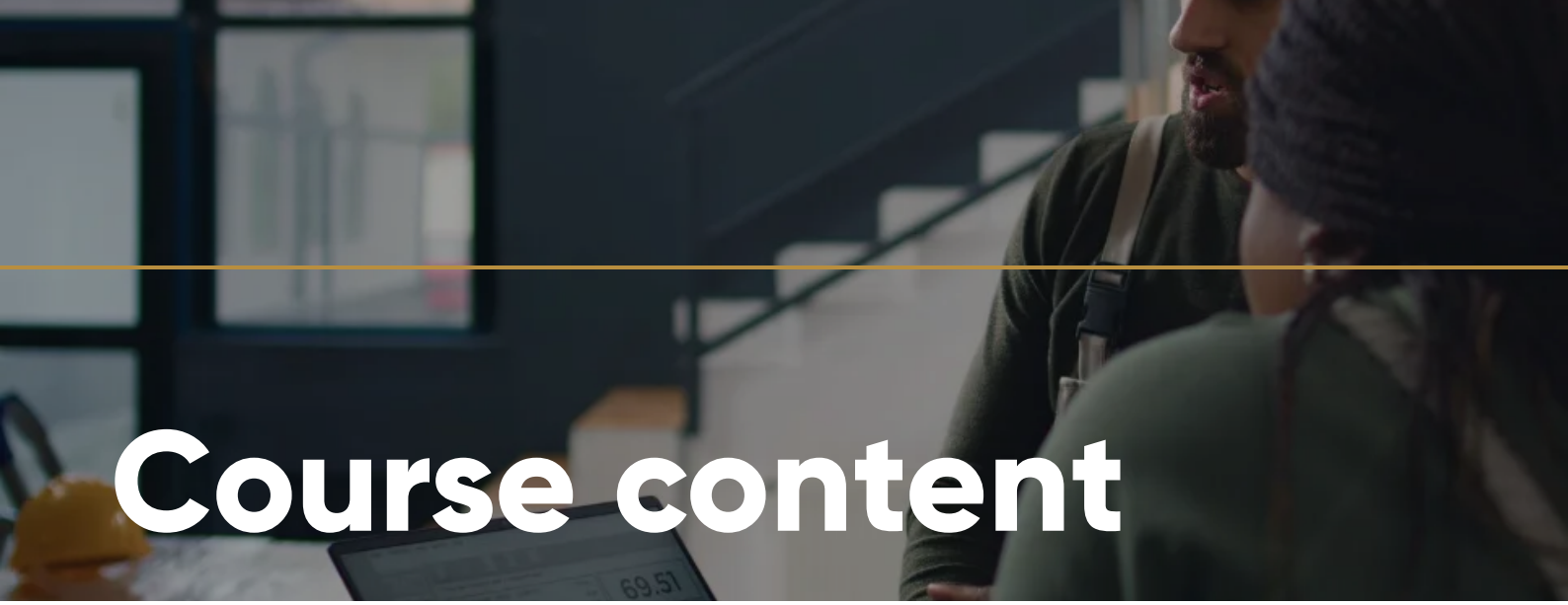
• Linking cost, schedule, and production uncertainties

• Modeling dependencies and correlations

• Production forecasting under uncertainty

• Scenario planning and stress testing

• Risk mitigation strategies and optimization



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• 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

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
8 - 12 June 2026	Amsterdam - Netherlands	Classroom	**€4,250.-**
6 - 10 July 2026	London - U.K	Classroom	**€4,200.-**
10 - 14 August 2026	Munich - Germany	Classroom	**€3,450.-**
31 August - 4 September 2026	Barcelona - Spain	Classroom	**€3,850.-**
5 - 9 October 2026	Barcelona - Spain	Classroom	**€3,850.-**
16 - 20 November 2026	Paris - France	Classroom	**€4,500.-**
7 - 11 December 2026	Munich - Germany	Classroom	**€4,250.-**
21 - 25 December 2026	Barcelona - Spain	Classroom	**€4,250.-**

Live online option	Online delivery is available at €1,850.-.