



## Monte Carlo Simulation and Distributions Fundamentals

### MODULE

#### About the Skill Module

Quality technical and business decisions require competent analyses of costs, benefits, and risks. You will learn a decision analysis process and foundation concepts so you can actively participate in multi-discipline evaluation teams. The focus is on designing and solving decision models.

Most examples and exercises relate to the petroleum industry. The methods apply to R&D, risk management, operating, and capital investment decisions.

Probability distributions express professional judgments about risks and uncertainties. These judgments carry through the calculations. Decision trees and influence diagrams provide clear communications and the basis for valuing each alternative. Monte Carlo simulation is a superior calculation alternative for some problems. Project modeling fundamentals and basic probability concepts provide the foundation for the calculations. We assume that you are familiar with Microsoft® Excel®. The mathematics in this course is straightforward and involves mostly common algebra. The emphasis is on practical techniques for immediate application.



[See example online learning module](#)

### **Target Audience**

Engineers, geoscientists, economists, planners, managers, and team leaders

### **You Will Learn**

Participants will learn how to:

- Name four discrete and four continuous probability distributions with an example of each
- Describe the correlation coefficient formula and provide three correlation examples
- Describe the Monte Carlo method
- Describe how to obtain a conditional probability from field data or Monte Carlo simulation (MCS) recordsets
- Describe at least two statistical MCS stopping rules
- Explain the improved efficiency of MCS using Latin hypercube sampling
- Compare payoff tables, decision trees, and MCS, identifying the strengths and weaknesses of each
- Explain optimization with MCS
- Describe two sensitivity analysis methods when using MCS
- Calculate deterministic variance and stochastic variance from a summary of deterministic and stochastic model results

## Product Details

Categories: Upstream

Disciplines: Energy Business

Levels: Foundation

Product Type: Individual Skill Module

Format: On-Demand

Duration: 6 hours (approx.)

**\$795.00**