Petroleum Risk and Decision Analysis - PRD

COURSE

About the Course

Good technical and business decisions are based on competent analysis of project costs, benefits and risks. Participants learn the decision analysis process and foundation concepts so they can actively participate in multi-discipline evaluation teams. The focus is on designing and solving decision models. About half the problems relate to exploration. The methods apply to R&D, risk management, and all capital investment decisions. Probability distributions express professional judgments about risks and uncertainties and are carried through the calculations. Decision tree and influence diagrams provide clear communications and the basis for valuing each alternative. Monte Carlo simulation is experienced in detail in a hand-calculation exercise. Project modeling fundamentals and basic probability concepts provide the foundation for the calculations. The mathematics is straightforward and mostly involves only common algebra. The emphasis is on practical techniques for immediate application.

This is a fast-paced course and recommended for those with strong English listening skills. This course is intended as the prerequisite for the Advanced Decision Analysis with Portfolio and Project Modeling course.

Target Audience

Geologists, engineers, geophysicists, managers, team leaders, economists, and planners.

You Will Learn

Participants will learn how to:

- Describe the elements of the decision analysis process and the respective roles of management and the analysis team
- Express and interpret judgments about risks and uncertainties as probability distributions and popular statistics
- Represent discrete risk events in Venn diagrams, probability trees, and joint probability tables
- Solve for expected values with decision trees, payoff tables, and Monte Carlo simulation (hand calculations)
- Craft and solve decision models
- Evaluate investment and design alternatives with decision tree analysis
- Develop and solve decision trees for value of information (VOI) problems

Course Content

- Decision Tree Analysis: decision models, value of information (a key problem type emphasized in the course), flexibility and control, project threats and opportunities
- Monte Carlo Simulation: Latin hypercube sampling, portfolio problems, optimization, advantages and limitations
- Decision Criteria and Policy: value measures, multiple objectives, HSE, capital constraint, risk aversion
- Modeling the Decision: influence diagrams, sensitivity analysis, modeling correlations
- Basic Probability and Statistics: four fundamental rules including Bayes' rule (the easy way), calibration and eliciting judgments, choosing distribution types, common misconceptions about probability
- Expected Value Concept: foundation for decision policy, features, pitfalls to avoid
- Implementing Decision Analysis: problem framing, guidelines for good analysis practice, team analyses, computer tools (discussion and demonstrations), mitigating risks
- Evaluating a multi-pay prospect (team exercise)

Product Details

Categories: Upstream

Disciplines: Energy Business

Levels: Foundation

Product Type: Course

Formats Available: In-Classroom

Instructors: PetroSkills Specialist Tim Nieman John Schuyler