

# PetroSkills®

## ADVANCED DECISION ANALYSIS with Portfolio and Project Modeling

### Course Instructor

Tim Nieman or John Schuyler

### Course Level

Specialized

### Who Should Attend

Evaluation engineers, analysts, managers, planners, economists

### You Will Learn How To

- Develop more-advanced decision models; reviewing value of imperfect information analyses
- Use decision analysis software for Monte Carlo simulation and decision tree analysis
- Model portfolio problems such as for capital budgeting, evaluating plays, wells in a field, and multi-pay locations
- Express and apply risk policy as a utility function.

### About the Course

Quality forecasts and evaluations depend upon well-designed project and portfolio models that are based upon clear decision policy, sound professional judgments, and a good decision process. Participants learn the methods and practice of building good evaluation models.

This course is intended for professionals involved with developing project evaluation, portfolio, and other forecasting and assessment models. We use the familiar Microsoft® Excel spreadsheet as the platform for project and risk assessment models. Add-in software provides Monte Carlo and decision tree capabilities. The course emphasis is on the evaluation concepts and techniques, rather than particular software programs.

Intermediate Excel spreadsheet competence (especially IF statements) in a Microsoft Windows® environment is required. This fast-paced course is recommended for those with strong English listening skills. Participants are expected to know the concepts in the Petroleum Risks and Decision Analysis course or have similar substantial background. Please visit <http://www.maxvalue.com/prereq.htm> for a list of expected pre-course competencies and link to a self-assessment quiz. A course comparison and selection guide is at <http://www.maxvalue.com/compare.htm>.

Enrollment is limited to approximately 16 participants. This course is intended as the prerequisite for the *Advanced Decision Analysis with Portfolio and Project Modeling* course.

*One personal computer is supplied, at added cost, for every two participants.*

### Course Format

Over half of the class time is devoted to hands-on modeling experiences with computers and decision analysis software. Solving decision trees and Monte Carlo simulation with software reinforces the concepts and analysis process experienced with hand calculators in the previous course.

Topic discussions complete the days in this concentrated course. The sessions are designed to be informal and participatory. Attendees are encouraged to bring non-proprietary decision problems for discussion or individual work.

The course notebook includes exercises, discussion text, checklists, calculation routines, and small model listings. Additionally, participants receive three reference textbooks written or co-authored by John Schuyler. Participants should bring a flash memory drive in order to copy instructor and personal solutions.

## Course Content

**Project Modeling:** influence diagrams, free cash flow concept; sensitivity analysis; documentation and good modeling practices; real options overview • **Monte Carlo Simulation:** prospect risking (similar to play analysis); calculating probabilities and distributions with simulation; modeling and optimizing investment portfolios; valuing added control and flexibility; stopping rules; ways to model correlation • **Decision Tree Analysis:** value of information review; sensitivity analysis; solving with utility for risk aversion • **Decision Policy:** overview of finance theory related to PV discount rate and risk (CAPM and modern portfolio theory); shareholder value model; portfolio optimization to maximize economic value; efficient frontiers; multi-criteria decisions; market value discount factor; risk policy as a utility function; calculating expected utility and certain equivalent; insurance and hedging; optimizing working interests • **Implementation:** presentation formats; model-centric enterprise model and balanced scorecard (dashboard) element focusing on shareholder value creation forecast.

## Examples

Participants are encouraged to bring examples from their work for discussion. Please contact PetroSkills Training if you wish to submit a problem in advance for possible use as a class exercise.

## About the Instructors (either would present the course)

**TIM NIEMAN** is President of Decision Applications, Inc., a San Francisco area based decision analysis consulting firm. His firm performs decision and risk analysis for various organizations facing complex decision problems. His recent oil and gas consulting work includes risk analysis of pipeline routing; risk analysis for deepwater flow assurance; portfolio analysis for budgeting E&P R&D portfolios; and development of methods for assessing new basin entry opportunities. Other recent work includes development of remediation and reuse strategies for impaired properties, including former refineries, manufacturing facilities and pipelines; numerous projects for the Yucca Mountain proposed nuclear waste repository; work for the US Geological Survey on mountain top coal mining, unconventional oil and gas drilling, basin-wide water management and climate change issues; and cancer causation modeling for national health organizations. He teaches various courses on decision analysis and quantitative modeling. Mr. Nieman was formerly Senior Decision Analyst for Geomatrix Consultants, an Oakland based geological and environmental consulting firm. Prior to that, he was Director of Operations for Lumina Decision Systems, a decision analysis consulting and software firm. And prior to that, he spent 14 years with Amoco as a geophysicist, economist, and risk and portfolio analyst. He has a B.S. in geology and an M.S. in geophysics from Michigan State University, and an MBA from Rice University.

**JOHN SCHUYLER**, CAM CCE CMA CMC CPIM PMP and PE, is a decision analyst, evaluation engineer, and investor. He founded his consulting practice, Decision Precision®, in 1988. He has over 36 years of experience in analysis, consulting, and management, primarily in the energy industry. He has presented over 280 courses in 34 countries since 1989. His focus has been in feasibility analysis, appraisals, corporate planning, and evaluation software

development. He was vice president and petroleum engineer with Security Pacific National Bank, planning and evaluation analyst and (later) manager of business systems for Cities Service Co., and senior management consultant with a national accounting firm. John is a member in eight professional organizations and is a frequent author and speaker on modern analysis practices. He holds a BS and an MS in mineral-engineering physics from Colorado School of Mines and an MBA from the University of Colorado. John is the revision author of *Decision Analysis for Petroleum Exploration, 2nd ed.*, author of *Risk and Decision Analysis in Projects, 2nd ed.*, and has written over 40 articles and handbook chapters. His Web site is <http://www.maxvalue.com>.

### **In-House Presentations**

All courses are available for in-house presentation to individual organizations. In-house courses may be structured the same as the public versions or tailored to meet your requirements. Special courses on virtually any petroleum-related subject can be arranged specifically for in-house presentation. For further information, contact our In-House Training Coordinator at one of the numbers listed below.

Telephone	1-800-821-5933 <i>toll-free in North America</i> 1-832-426-1234
Facsimile	1-832-426-1244
E-Mail	<a href="mailto:training@petroskills.com">training@petroskills.com</a>

### **Public Course Presentations**

How to Contact PetroSkills, LLC

Telephone	1-800-821-5933 <i>toll-free in North America or</i> 1-918-828-2500
Facsimile	1-918-828-2580
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World Wide Web	<a href="http://www.petroskills.com">www.petroskills.com</a>
Address	P.O. Box 35448, Tulsa, Oklahoma 74153-0448 U.S.A.

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Management buy-in is essential for successfully applying decision analysis. Either instructor welcomes an opportunity to present an executive seminar if an hour with managers can be arranged sometime during the week. Managers are also welcome to visit the course during session. A one-half day Executive Workshop is available at moderate cost if company executives have time and interest. The key topics in these special sessions include essential concepts, corporate decision policy, how to interpret a decision analysis, and the manager's role in evaluation quality control.



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