

# APPLIED DECISION ANALYSIS with PORTFOLIO and PROJECT MODELING

## Course Instructor

John Schuyler

## Course Level

Intermediate

## Who Should Attend

Evaluation engineers, analysts, managers, economists, and broad-skilled engineering and geoscience professionals responsible for the building and presenting decision and forecast models

## You Will Learn

- Transaction, physical system, and project modeling for forecasting production, cash-flows and project schedule
- Monte Carlo simulation modeling in a spreadsheet program\*
- Decision tree analysis on a personal computer\*
- Portfolio problems such as evaluating plays and multi-play drilling locations
- Expressing and applying risk policy as a utility function.
- More-advanced concepts in project evaluation, finance, optimization and portfolio management

\*Specific software and emphasis for In-House courses can be specified by the client organization

## About the Course

This course is designed for persons responsible for developing forecasts, analyzing capital investments, and determining optimal corporate strategy. Attendees learn how to develop business and transaction models using the approach and concepts of decision analysis. The techniques focus on Monte Carlo simulation, decision tree analysis, and influence diagrams. Risk, reserve/resource and cash flow models are built to solve example problems drawn from the petroleum industry.

Participants experience the solution methods through instructor demonstrations and hands-on exercises solved with personal computers. The emphasis is on practical, straightforward techniques for immediate application. Although several programs are used in the exercises, the emphasis is on general problem-solving techniques rather than on learning particular software.

This course is designed as a sequel to *Petroleum Risks and Decision Analysis* by Mr. Schuyler.

Prerequisites for this course are:

- Prior attendance and having done well in *Petroleum Risks and Decision Analysis* (recommended), *Economic Evaluation of Prospects and Producing Properties*, or equivalent background (prerequisite knowledge topics are listed at <http://www.maxvalue.com/prereq.htm>)
- Competence with MS Excel in a Windows environment.

Additionally, participants will be benefited by some prior experience in economic evaluation, such as by attending either *Basic Petroleum Economics* or *Economics of Worldwide Petroleum Exploration* taught by Richard Seba.

**Course Format**

Over half of the class time is devoted to hands-on modeling experiences. Topic discussions and instructor demonstrations 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.

Class exercises are designed to allow participants to discover and experience the important concepts. The course notebook includes copies of slides, exercises, discussion text, checklists, calculation routines, and small model listings. Additionally, participants receive three reference textbooks written or co-authored by John Schuyler. Participants receive a diskette containing solutions and selected examples and for recording personal solutions.

Depending upon the facility, there is usually one pair of participants per personal computer workstation.

**Course Content**

- ◆ **Business/Transaction Modeling:** Decision analysis approach and 10-step Decision Precision® process; decision analysis compared with real options analysis; flow and influence diagrams; good development practice and documentation; modeling correlation relationships; optimization; competitive bidding
- ◆ **Monte Carlo Simulation Modeling Inside a Spreadsheet:** Using add-in functions (using @RISK or Crystal Ball) to represent probability distributions; design and documentation; advantages and limitations; project (e.g., drilling) portfolios, multi-pay prospects, assessing exploration risks from play analysis and discovery process models, correlation between prospects in a play, optimizing a design decision
- ◆ **Decision Tree Analysis:** Solving problems with decision tree software (using either DATA or PrecisionTree); model-building practice; reversing node order; value of information problems and Bayes' rule review; linking decision trees to spreadsheet cashflow models.
- ◆ **Decision Criteria:** Value measures and decision rules; optimizing shareholder value; describing risk aversion as a utility function; solving for expected utility and certainty equivalents; optimizing working interest and amount of life insurance; cost of capital; portfolio concepts; ranking projects for capital constraints; multi-criteria decisions
- ◆ **Project Risk Management:** CPM/PERT diagrams; precedence diagramming method; project schedule modeling; project risk management process
- ◆ **Emerging Decision Technologies:** Overviews of expert systems, neural networks, fuzzy logic, genetic algorithms, chaos theory, fractals, and other promising techniques.

**2005 SCHEDULE and TUITION**

**5 DAYS**

HOUSTON, TEXAS

June 20-24, 2005.....US\$2,200\*

*\*Plus computer charge*

**About the Instructor**

**JOHN SCHUYLER**, CAM CCE CMA CMC CPIM PMP and PE, is a decision analyst and evaluation engineer. He founded his consulting practice, Decision Precision®, in 1988. He has over 29 years of experience in analysis, consulting, and management, primarily in the energy industry. He has presented over 220 courses in 26 countries since 1990. 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.

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### **Public Course Presentations**

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