Haward Technology Middle East

COURSE OVERVIEW DE0927
Introduction to Risk & Consequence Modelling Techniques

Course Title
Introduction to Risk & Consequence Modelling Techniques

Course Date/Venue
Session 1: April 21-25, 2025/Fujairah Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE
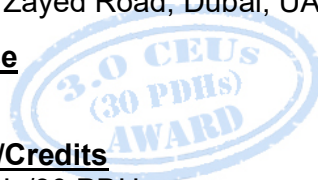Session 2: October 19-23, 2025/Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE
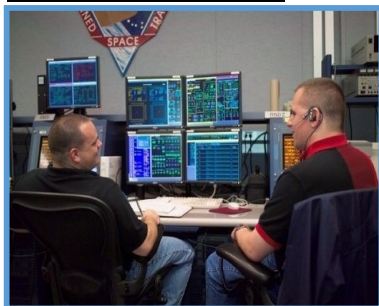
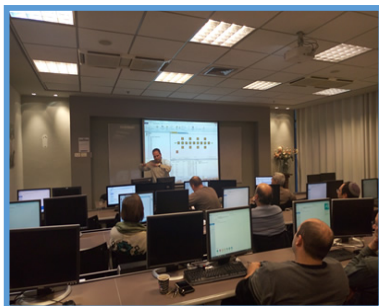**Course Reference**
DE0927

**Course Duration/Credits**
Five days/3.0 CEUs/30 PDHs

Course Description

This hands-on, highly-interactive course includes various practical sessions and exercises. Theory learnt will be applied using the economic evaluation simulation.

One of the most characteristic features of the oil and gas industry is the dramatic risk/reward relationship associated with exploration. Industry professionals must understand these dynamics and understand the language of risk analysis. 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. 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.
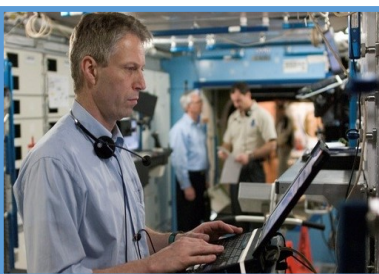
This course provides participants a practical, hands-on approach to modern techniques in petroleum risk management and strategic decision-making. The techniques presented are applicable to all aspects of oil and gas exploration and production - prospect evaluation, resource allocation, diversification, risk sharing, and corporate planning.

The course helps participants develop problem solving, leadership, and functional skills necessary to manage the modern oil and gas enterprise. Participants will find the concepts and techniques stimulating and beneficial - enabling them to apply risk and decision making concepts to their jobs immediately.

Participants learn how to design and solve decision trees and payoff tables, popular decision modeling techniques. These methods provide clear communications and the basis for valuing each alternative. Judgments about risks and uncertainties are expressed as probability distributions. Monte Carlo simulation, another powerful technique, is also presented. Four basic probability concepts provide the foundation for the calculations. The mathematics is straightforward and mostly involves only common algebra.

Course Objectives

Upon successful completion of this course, each participant will be able to:-

- Apply and gain an in-depth knowledge on petroleum economics

- Discuss the basics of decision analysis, the value of information, decision tree class problem and Monte Carlo simulation

- Use decision trees and Monte Carlo simulation

- Explain decision criteria and model the investment opportunity

- Recognize the basic probability and statistics, the risk analysis and expected value concept

- Carryout strategies and optimization of advanced risk analysis and present analysis and results

- Discuss the analysis methods in the petroleum industry as well as implement decision analysis and carryout team workshop

Who Should Attend

This course provides an overview of all significant aspects and considerations of petroleum economics for geologists, engineers, geophysicists, managers, planning analysts, senior planners and planners.

Exclusive Smart Training Kit - H-STK®

Participants of this course will receive the exclusive "Haward Smart Training Kit" (H-STK®). The H-STK® consists of a comprehensive set of technical content which includes electronic version of the course materials conveniently saved in a Tablet PC.

Course Fee

US$ 8,000 per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Course Certificate(s)

Internationally recognized certificates will be issued to all participants of the course who completed a minimum of 80% of the total tuition hours.

Certificate Accreditations

Certificates are accredited by the following international accreditation organizations:

- **British Accreditation Council (BAC)**

  Haward Technology is accredited by the **British Accreditation Council** for **Independent Further and Higher Education** as an **International Centre**. BAC is the British accrediting body responsible for setting standards within independent further and higher education sector in the UK and overseas. As a BAC-accredited international centre, Haward Technology meets all of the international higher education criteria and standards set by BAC.

- **The International Accreditors for Continuing Education and Training (IACET - USA)**

  Haward Technology is an Authorized Training Provider by the International Accreditors for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this authority, Haward Technology has demonstrated that it complies with the **ANSI/IACET 2018-1 Standard** which is widely recognized as the standard of good practice internationally. As a result of our Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for its programs that qualify under the **ANSI/IACET 2018-1 Standard**.

  Haward Technology's courses meet the professional certification and continuing education requirements for participants seeking **Continuing Education Units** (CEUs) in accordance with the rules & regulations of the International Accreditors for Continuing Education & Training (IACET). IACET is an international authority that evaluates programs according to strict, research-based criteria and guidelines. The CEU is an internationally accepted uniform unit of measurement in qualified courses of continuing education.

  Haward Technology Middle East will award **3.0 CEUs** (Continuing Education Units) or **30 PDHs** (Professional Development Hours) for participants who completed the total tuition hours of this program. One CEU is equivalent to ten Professional Development Hours (PDHs) or ten contact hours of the participation in and completion of Haward Technology programs. A permanent record of a participant's involvement and awarding of CEU will be maintained by Haward Technology. Haward Technology will provide a copy of the participant's CEU and PDH Transcript of Records upon request.

Accommodation

Accommodation is not included in the course fees. However, any accommodation required can be arranged at the time of booking.

Course Instructor(s)

This course will be conducted by the following instructor(s). However, we have the right to change the course instructor(s) prior to the course date and inform participants accordingly:

Dr. Chris Kapetan, PhD, MSc, is a **Senior Petroleum Engineer** with over **30 years** of international experience within the **onshore** and **offshore oil** & **gas** industry. His wide experience covers **Asset Management** Principles, Risks & Economics, **Petroleum Economics**, **Decision Analytic Modelling Methods** for **Economic Evaluation**, **Probabilistic Risk Analysis** (**Monte Carlo Simulator**) **Risk Analysis Foundations**, **Global Oil Demand**, Crude Oil Market, Global Oil Reserves, Oil Supply & Demand, Governmental Legislation, Contractual Agreements, **Financial** Modeling, **Oil Contracts**, **Project Risk Analysis**, **Feasibility Analysis** Techniques, **Capital Operational Costs**, Oil & Gas Exploration Methods, **Reservoir** Evaluation, **Extraction of Oil & Gas**, **Crude** Oil Types & Specifications, Sulphur, Sour Natural Gas, **Natural Gas Sweeting**, **Petroleum Production**, Field Layout, **Production** Techniques & Control, **Surface Production** Operations, **Oil Processing**, Oil Transportation-Methods, **Flowmetering & Custody Transfer** and **Oil Refinery**. Further, he is also well-versed in Enhanced Oil Recovery (**EOR**), Electrical Submersible Pumps (**ESP**), **Oil Industries Orientation**, **Geophysics**, Cased Hole **Formation Evaluation**, Cased Hole **Applications**, Cased Hole **Logs**, Production **Operations**, Production **Management**, Perforating **Methods & Design**, Perforating **Operations**, **Fishing** Operations, **Well & Reservoir** Testing, **Reservoir Stimulation**, **Hydraulic Fracturing**, **Carbonate** Acidizing, **Sandstone** Acidizing, **Drilling Fluids Technology**, Drilling **Operations**, **Directional** Drilling, **Artificial Lift**, **Gas Lift Design**, **Gas Lift Operations**, **Petroleum Business**, **Field Development Planning**, **Gas Lift Valve** Changing & Installation, **Well Completion** Design & Operation, Well **Surveillance**, Well **Testing**, Well **Stimulation** & **Control** and **Workover Planning**, **Completions** & **Workover**, **Rig Sizing**, **Hole Cleaning** & **Logging**, **Well Completion**, **Servicing** and **Work-Over Operations**, Practical **Reservoir Engineering**, **X-mas Tree & Wellhead** Operations, Maintenance & Testing, **Advanced Petrophysics/Interpretation** of **Well Composite**, **Construction Integrity** & **Completion**, **Coiled Tubing Technology**, **Corrosion Control**, **Slickline**, **Wireline & Coil Tubing**, **Pipeline Pigging**, **Corrosion Monitoring**, **Cathodic Protection** as well as Root Cause Analysis (**RCA**), Root Cause Failure Analysis (**RCFA**), **Gas Conditioning & Process Technology**, **Production Safety** and **Delusion of Asphalt**. Currently, he is the **Operations Consultant** & the **Technical Advisor** at **GEOTECH** and an independent **Drilling Operations Consultant** of various engineering services providers to the international clients as he offers his expertise in many areas of the **drilling & petroleum discipline** and is well **recognized & respected** for his process and procedural expertise as well as ongoing participation, interest and experience in continuing to promote technology to producers around the world.

Throughout his long career life, Dr. Chris has worked for many international companies and has spent several years **managing** technically **complex wellbore interventions** in both **drilling & servicing**. He is a **well-regarded** for his **process** and **procedural expertise**. Further, he was the **Operations Manager** at **ETP Crude Oil Pipeline Services** where he was fully responsible for optimum operations of crude oil pipeline, **workover** and **directional drilling**, **drilling rigs** and equipment, drilling of various geothermal deep wells and **exploration wells**. Dr. Chris was the **Drilling** & **Workover Manager** & **Superintendent** for **Kavala Oil** wherein he was responsible for supervision of **drilling operations** and **offshore exploration**, quality control of performance of **rigs**, **coiled tubing**, crude oil transportation via pipeline and abandonment of **well** as per the API requirements. He had occupied various key positions as the **Drilling Operations Consultant**, **Site Manager**, **Branch Manager**, **Senior Drilling** & **Workover Manager** & **Engineer** and **Drilling** & **Workover Engineer**, **Operations Consultant**, **Technical Advisor** in several petroleum companies responsible mainly on an **offshore** sour oil field (under water flood and gas lift) and a gas field. Further, Dr. Chris has been a **Professor** of the **Oil Technology College**.

Dr. Chris has **PhD** in **Reservoir Engineering** and a **Master's** degree in **Drilling & Production Engineering** from the **Petrol-Gaze Din Ploiesti University**. Further, he is a **Certified Surfaced BOP Stack Supervisor** of **IWCF**, a **Certified Instructor/Trainer**, a **Certified Trainer/Assessor/Internal Verifier** by the **Institute of Leadership & Management** (**ILM**) and has conducted **numerous short courses**, **seminars** and **workshops** and has published several technical books on **Production Logging**, **Safety Drilling Rigs** and **Oil Reservoir**.

Training Methodology

All our Courses are including **Hands-on Practical Sessions** using equipment, State-of-the-Art Simulators, Drawings, Case Studies, Videos and Exercises. The courses include the following training methodologies as a percentage of the total tuition hours:-

30%   Lectures
20%   Practical Workshops & Work Presentations
30%   Hands-on Practical Exercises & Case Studies
20%   Simulators (Hardware & Software) & Videos

In an unlikely event, the course instructor may modify the above training methodology before or during the course for technical reasons.

Course Program

The following program is planned for this course. However, the course instructor(s) may modify this program before or during the course for technical reasons with no prior notice to participants. Nevertheless, the course objectives will always be met:

Day 1

Time	Topic
0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	**PRE-TEST**
0830 – 0900	***Decision Tree Analysis*** *Calculation Procedures • Valuing Additional Information and Control • Advantages and Limitations Contrasted with Monte Carlo Simulation*
0900 – 0930	*Break*
0930 – 0945	***Decision Analysis Basics*** *Review of Economics • Statistics (Using Excel) • Probability Theory • Decision Trees Introduction • Risk Tolerance*
0945 – 1230	***Value of Information, Decision Tree Class Problem, Introduction to Monte Carlo Simulation*** *Typical Applications for Upstream • How Monte Carlo Simulation Works • Introduction to Simulation Software - Menus, Distribution, Settings, Outputs*
1230 - 1245	*Break*
1245 – 1420	***Probabilistic Risk Analysis - Monte Carlo Simulation*** *Sampling Techniques • Building Simple Models and Interpreting Results • Correlation between Inputs and Output • Solution Accuracy and Stopping Rules • Latin Hypercube Sampling • Correlation • Considerations for Portfolio Problems and Optimization • Advantages and Limitations • Using Excel and Monte Carlo Software to Analyze Data Volumetric Products for Resources and Reserves • Aggregation Models and the Central Limit Theorem*
1420 – 1430	***Recap***
1430	*Lunch & End of Day One*

Day 2

Time	Topic
0730 – 0930	***Probabilistic Risk Analysis and Risk Management Using Monte Carlo Simulation*** *Changing Distribution Type – Testing Sensitivity • Correlation: Recognising and Incorporating Dependency, Cross Plots, Effects of Correlation • Modeling Unusual (Rare) Events by Assigning Probability and outcome • Simple Production Forecasts and Cashflow*

0930 – 0945	*Break*
0945 – 1100	***Decision Criteria*** *Value Measures • Decision Rules • Decisions with Multiple Objectives • Discrediting Intuition*
1100 – 1230	***Decision Criteria (cont'd)*** *Advantages of the Decision Analysis Approach • Dealing With Capital Constraint and Risk Aversion • Portfolios*
1230 – 1245	*Break*
1245 – 1420	***Modeling the Investment Opportunity*** *The Ten-Step Decision Precision Problem-Solving Process • Real Options Analysis • Operations, Earnings and Cash-Flow Model Structures • Modeling Tools, Including Influence Diagrams (Briefly)*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Two*

Day 3

0730 – 0930	***Modeling the Investments Opportunity (cont'd)*** *Deal Structures • Sensitivity Analysis • Scenario Analysis*
0930 – 0945	*Break*
0945 – 1100	***Basic Probability and Statistics*** *Four Fundamental Probability Rules, Including Bayes' Theorem • Types and Uses of Distributions Applicable to the Petroleum Industry, Especially Exploration • "Gambler's Ruin" Concept*
1100 – 1230	***Basic Probability and Statistics (cont'd)*** *Alternate Ways to Represent Correlation Between Variables • Common Misconceptions about Probabilities*
1230 – 1245	*Break*
1245 – 1420	***Risk Analysis and Expected Value Concept*** *Quantitative Estimates of Risk and Uncertainty • Capturing Expert Judgments*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Three*

Day 4

0730 – 0930	***Risk Analysis and Expected Value Concept (cont'd)*** *Recognizing and Avoiding Biases and Errors*
0930 – 0945	*Break*
0945 – 1100	***Advanced Risk Analysis – Strategies and Optimisation, Presenting Analyses and Results*** *Layered Systems • Faulted Reservoir Considerations • Production Models Pseudo-Cases • Determining Well Sequence • Class Problem Using Monte Carlo Simulation*
1100 – 1230	***Analysis Methods in the Petroleum Industry*** *Characteristic Risks of Exploration, Field Development, EOR, Transport and Plant Investments*
1230 – 1245	*Break*
1245 – 1420	***Analysis Methods in the Petroleum Industry (cont'd)*** *Risk Mitigation Methods*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Three*

Day 5

0730 – 0930	**Implementing Decision Analysis** *Interpreting Decision Analysis Results from a Management Perspective • Facilitating Team Analyses*
0930 – 0945	*Break*
0945 – 1130	**Implementing Decision Analysis (cont'd)** *Low-Cost Computer Tools • Establishing Credibility in the Analysis*
1130 – 1230	**Team Workshop** *Evaluate a Multi-Pay Prospect Using Trees and the Probability Concepts Learned in the Course*
1230 – 1245	*Break*
1245 – 1345	**Team Workshop (cont'd)** *Solving again using Monte Carlo Simulation*
1345 – 1400	**Course Conclusion**
1400 – 1415	**POST-TEST**
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

Practical Session

Practical sessions will be organized during the course for delegates to practice the theory learnt. Delegates will be provided with an opportunity to carryout various exercises using the simulator "Monte Carlo".

Monte Carlo Simulation
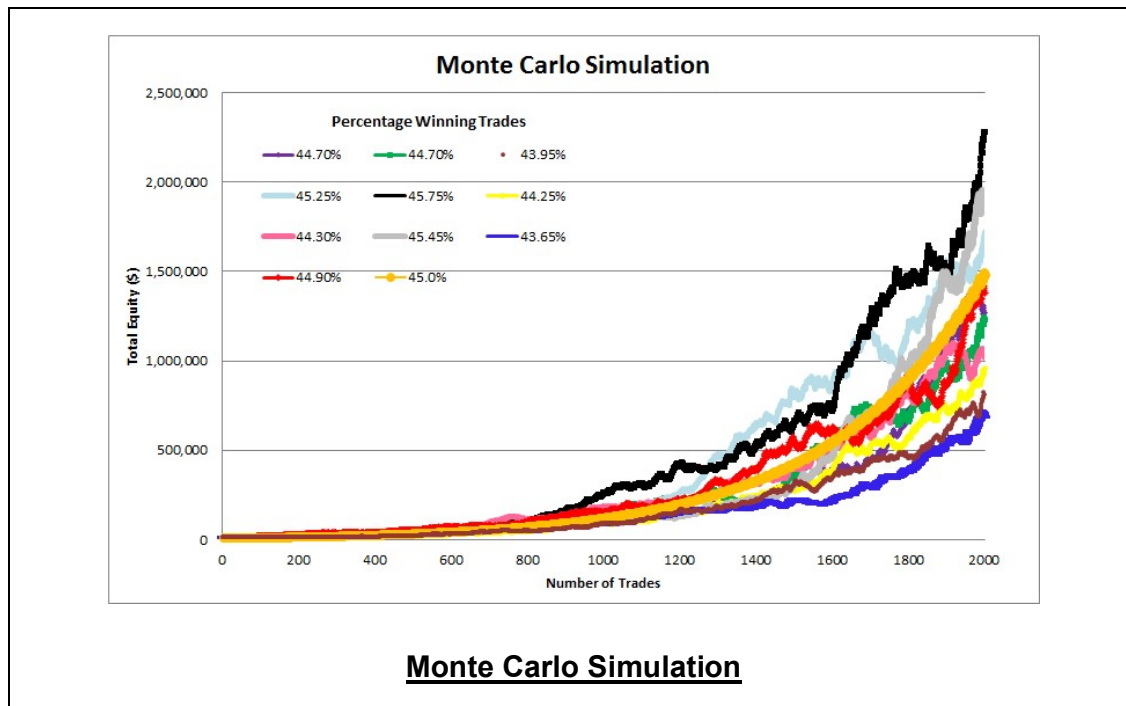
Course Coordinator

Mari Nakintu, Tel: +971 2 30 91 714, Email: mari1@haward.org