COURSE OVERVIEW TM1125
Quantitative Decision Making in the Oil/Gas Industry

Course Title
Quantitative Decision Making in the Oil/Gas Industry

Course Date/Venue
Please see page 3

Course Reference
TM1125

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

Course Description

This practical and highly-interactive course includes real-life case studies and exercises where participants will be engaged in a series of interactive small groups and class workshops.

This course is designed to provide participants with a detailed and up-to-date overview of Quantitative Decision Making in the Oil/Gas Industry. It covers the decision making in oil/gas, quantitative analysis, statistical concepts for decision making and decision trees in oil/gas; the data sources and quality in oil/gas and risk identification, classification and probability assessment techniques; the expected value and variance, sensitivity and scenario analysis, portfolio decision making and real options analysis; and the discounted cash flow (DCF) analysis, cost-benefit and cost-effectiveness analysis, production forecasting and decline curve analysis.

Further, the course will also discuss the optimization techniques and economic modeling under uncertainty; the cost of capital and hurdle rates, exploration risk analysis, reserves and resources estimation; the drilling decision analysis and production optimization decisions; and the facility sizing, investment timing, quantitative safety and environmental decisions.

During this interactive course, participants will learn the asset modeling for decisions, quantitative decision support systems and communicating quantitative results; and the decision making techniques covering Delphi method, nominal group technique and managing bias in group settings.

Course Objectives

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

- Apply and gain a good working knowledge on quantitative decision making in the oil/gas industry
- Carryout decision making in oil/gas, quantitative analysis, statistical concepts for decision making and decision trees in oil/gas
- Identify data sources and quality in oil/gas and apply risk identification, classification and probability assessment techniques
- Recognize expected value and variance and apply sensitivity and scenario analysis, portfolio decision making and real options analysis
- Employ discounted cash flow (DCF) analysis, cost-benefit and cost-effectiveness analysis, production forecasting and decline curve analysis
- Illustrate optimization techniques and economic modeling under uncertainty
- Identify cost of capital and hurdle rates and apply exploration risk analysis, reserves and resources estimation
- Carryout drilling decision analysis, production optimization decisions, facility sizing, investment timing, quantitative safety and environmental decisions
- Integrate asset modeling for decisions, recognize quantitative decision support systems and communicate quantitative results
- Apply decision making techniques covering Delphi method, nominal group technique and managing bias in group settings

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**.*

Who Should Attend

This course provides an overview of all significant aspects and considerations of quantitative decision making in the oil/gas industry for project managers, operations managers, planning engineers, process engineers, reservoir engineers, supply chain professionals, financial analysts, business development managers, HSE managers involved in risk-based decisions, data analysts supporting oil/gas operations, senior supervisors and team leaders involved in strategic decisions, technical specialists engaged in project evaluation and optimization and other technical staff.

Course Date/Venue

Session(s)	Date	Venue
1	June 30-August 04, 2025	TBA Meeting Room, Grand Hyatt Athens, Athens, Greece
2	August 25-29, 2025	TBA Meeting Room, JW Marriott Hotel Madrid, Madrid, Spain
3	November 01-05, 2025	Tamra Meeting Room, Al Bandar Rotana Creek, Dubai, UAE
4	January 19-23, 2026	Hampstead Meeting Room, London Marriott Hotel Regents Park, London, UK

Course Fee

Dubai	**US$ 5,500** per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
London/ Madrid/ Athens	**US$ 8,800** per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

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 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

Haward's 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**. Haward's certificates are internationally recognized and accredited by the British Accreditation Council (BAC). 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.

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. Frederick Labuschagne, PhD, MBL, BA, BD, is a **Senior Contracts & Project Manager** with over **25 years** of extensive experience. His expertise includes **Contract Management**, **Project Management**, **Procurement Management**, **Document Control Process & Practical Solutions**, Leadership & **Business** Management (Change Management, Paradigm & Paradigm Shifts); **ISO 9001 Lead Auditor**, **Project**, **Finance** & Asset Management; Strategic Leadership & Planning; **Productivity** & Efficiency Improvements; Administration Skills Management; **Organisational** Management, Reinvention & Proficiency; **Risk** Management; Performance Management; Productive Change Management & Organizational Development; Production & Operations Management (Decision Analysis, **PERT CPM**, Facilities & Jobs Design, and Systems Improvement); **Human** Relations and Organizations; Work Study and Product **Improvement**.

Currently, Dr. Labuschagne is the **Lead Consultant** for the **Institute for Dynamic Interaction** where he spearheads **major international projects** and comprehensive presentations. Among these are sessions on Human Resource & Performance Management, **Emotional Intelligence**, **Strategic Planning** & Creative Thinking, Personal & Personnel Development, Team Building, Effective Communication, Presentation & Interpersonal Skills, and Habits of Highly Effective People. Herein, he has built an evident reputation for first-class motivational team leadership management, development & **mentoring**, conforming to effective performance, analysing progress as well as identifying development requirements.

Dr. Labuschagne has **PhD** and **Master** degrees in **Business Leadership**, a **BA** in **Management** and is a registered **MBTI** (Myers-Briggs Type Indicator) Consultant with the Consulting Psychologists & HR Development. Further, he has performed **numerous assessments** and **workshops** for renowned businesses, utilizing key success attributes in delivering feasible results & providing effective leadership.

Accommodation

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

Course Program

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

Day 1

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0930	***Introduction to Decision Making in Oil/Gas*** *Types of Decisions Across the Oil/Gas Value Chain • Role of Uncertainty & Risk in Decision Making • Economic versus Technical Decision Drivers • Case Examples of Key Industry Decisions*
0930 – 0945	*Break*
0945 – 1030	***Principles of Quantitative Analysis*** *Structured Decision Processes • Types of Quantitative Models • Input Data Requirements • Limitations & Ethical Considerations*
1030 – 1130	***Statistical Concepts for Decision Making*** *Probability Distributions (Normal Log-Normal Triangular) • Measures of Central Tendency & Dispersion • Confidence Intervals & Hypothesis Testing • Correlation & Causation*
1130 – 1215	***Decision Trees in Oil/Gas*** *Structure of Decision Trees • Assigning Probabilities & Outcomes • Sensitivity Analysis in Decision Trees • Real-World Applications (e.g. Drilling Decisions)*
1215 – 1230	*Break*
1230 – 1330	***Monte Carlo Simulation Basics*** *Monte Carlo Logic & Applications • Building Basic Simulation Models • Interpretation of Outputs • Common Pitfalls & Good Practices*
1330 – 1420	***Data Sources & Quality in Oil/Gas*** *Types of Operational & Financial Data • Data Validation Techniques • Handling Missing/Incomplete Data • Importance of Data Integrity*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day One*

Day 2

0730 – 0830	***Risk Identification & Classification*** *Operational Risk • Market & Price Risk • Political & Regulatory Risk • Environmental & Safety Risk*
0830 – 0930	***Probability Assessment Techniques*** *Subjective versus Objective Probabilities • Eliciting Expert Judgment • Bayesian Updating in Oil/Gas Contexts • Use of Analogs & Historical Data*
0930 – 0945	*Break*
0945 – 1100	***Expected Value & Variance*** *Calculating Expected Monetary Value (EMV) • Variance & Standard Deviation • Coefficient of Variation in Comparing Options • Using EMV for Ranking Projects*

1100 – 1215	***Sensitivity & Scenario Analysis*** *Tornado Diagrams • One-Way versus Multi-Way Sensitivity • Scenario Building for Price & Cost Assumptions • Application to Field Development Plans*
1215 – 1230	*Break*
1230 – 1330	***Portfolio Decision Making*** *Portfolio Theory in Oil/Gas Asset Management • Diversification Benefits • Correlation Between Projects • Portfolio Optimization Models*
1330 – 1420	***Real Options Analysis*** *Introduction to Real Options in Oil/Gas • Types of Real Options (e.g. Expand Abandon Defer) • Valuation Methods (Decision Tree + Options) • Application Examples (e.g. Appraisal Wells Expansion Phases)*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Two*

Day 3

0730 – 0830	***Discounted Cash Flow (DCF) Analysis*** *Time Value of Money Concepts • Net Present Value (NPV) Calculation • Internal Rate of Return (IRR) • Payback Period & Profitability Index*
0830 – 0930	***Cost-Benefit & Cost-Effectiveness Analysis*** *Cost Structure in Oil/Gas Projects • Direct versus Indirect Costs • Comparing Mutually Exclusive Projects • Break-Even Analysis*
0930 – 0945	*Break*
0945 – 1100	***Production Forecasting & Decline Curve Analysis*** *Types of Decline Curves (Exponential Hyperbolic) • Building Forecasting Models • Incorporating Uncertainty in Forecasts • Use in Decision Making*
1100 – 1215	***Optimization Techniques*** *Linear Programming Applications • Constrained Optimization • Case Production Allocation Optimization • Use of Optimization Software Tools*
1215 – 1230	*Break*
1230 – 1330	***Economic Modeling Under Uncertainty*** *Stochastic Inputs in Economic Models • Probabilistic NPV • Generating Cumulative Probability Plots • Evaluating Upside/Downside Cases*
1330 – 1420	***Cost of Capital & Hurdle Rates*** *WACC for Oil/Gas Companies • Country & Project-Specific Risk Premiums • Hurdle Rates for High-Risk Regions • Sensitivity to Discount Rate Assumptions*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Three*

Day 4

0730 – 0830	***Exploration Risk Analysis*** *Play/Prospect Risk Assessment • Chance of Success (Geological Commercial) • Volumetric Risk Distributions • Aggregation of Prospect Risks*
0830 – 0930	***Reserves & Resources Estimation*** *P10 P50 P90 Concepts • Probabilistic Volumetrics • Resource Classification Frameworks (SPE PRMS) • Risk versus Uncertainty in Reserves Estimation*
0930 – 0945	*Break*
0945 – 1100	***Drilling Decision Analysis*** *Well Cost Uncertainty • Probability of Technical Success • Side-Track Decision Trees • Valuing Pilot Wells*
1100 – 1215	***Production Optimization Decisions*** *Quantitative Lift Optimization • Surface versus Subsurface Constraints • Multi-Well Production Scenarios • Real-Time Data Integration*
1215 – 1230	*Break*
1230 – 1330	***Facility Sizing & Investment Timing*** *Sizing Under Demand Uncertainty • Expandable Facility Design Decisions • Timing of Investment (Now versus Later) • Use of Decision Analysis Tools*
1330 – 1420	***Quantitative Safety & Environmental Decisions*** *Risk Matrices in HSE Decisions • Quantitative Consequence Analysis • Environmental Risk Modeling • Decision Making Under Regulatory Constraints*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Four*

Day 5

0730 – 0830	***Integrated Asset Modeling for Decisions*** *Linking Subsurface Surface & Economic Models • Benefits of Integrated Modeling • Uncertainty Propagation • Real-Time Model Updates*
0830 – 0930	***Quantitative Decision Support Systems*** *Tools (e.g. @Risk Crystal Ball MATLAB) • Building Interactive Dashboards • Real-Time Scenario Evaluation • Data Visualization for Decisions*
0930 – 0945	*Break*
0945 – 1030	***Communicating Quantitative Results*** *Presenting to Technical Audiences • Presenting to Executives • Storytelling with Data • Visual Aids & Pitfalls to Avoid*
1030 -1130	***Group Decision Making Techniques*** *Delphi Method • Nominal Group Technique • Role of Facilitated Workshops • Managing Bias in Group Settings*
1130 - 1230	***Lessons Learned from Oil/Gas Case Studies*** *Examples of Successful Quantitative Decisions • Examples of Failures & Root Causes • Quantitative versus Qualitative Balance • Continuous Improvement in Decision Processes*

1230 – 1245	*Break*
1245 – 1345	***Wrap-Up & Practical Exercises*** *Group Simulation Exercise (Multi-Criteria Decision Making) • Hands-On with Decision Tree Software • Discussion on Participants' Challenges • Action Planning for Applying Tools in the Workplace*
1345 – 1400	***Course Conclusion*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Course Topics that were Covered During the Course*
1400 – 1415	***POST-TEST***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

Practical Sessions

This practical and highly-interactive course includes real-life case studies and exercises:-

Course Coordinator

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