



COURSE OVERVIEW DE1084

Drilling Engineer: Drilling Efficiency, Problem Solving & Optimization Techniques

Course Title

Drilling Engineer: Drilling Efficiency, Problem Solving & Optimization Techniques

Course Date/Venue

Please see page 3

Course Reference

DE1084

Course Duration/Credits

Five days/3.0 CEUs/30 PDHs



Course Description



This practical and highly-interactive workshop includes various practical sessions and exercises. Theory learnt will be applied using our state-of-the-art simulators.



This course is designed to provide participants with a detailed and up-to-date overview of Drilling Engineer: Drilling Efficiency, Problem Solving and Optimization Techniques. It covers the drilling efficiency, well planning and design for efficiency, drill bit selection and hydraulics; the drill string and bottom hole assembly (BHA) design, mud systems and hole cleaning and rig selection and equipment capabilities; the real-time data acquisition, drilling performance metrics and visualization and analytics tools; the downhole dynamics and vibration analysis, drilling hydraulics monitoring; and the drill bit tracking and optimization.



Further, the course will also discuss the structured problem-solving techniques, stuck pipe and hole problems and well control and kick management; the wellbore stability challenges, torque and drag optimization and cementing and well integrity issues; and the automated drilling systems, predictive analytics and machine learning and pressure management strategies.

During this interactive course, participants will learn the rig power consumption monitoring, fuel optimization and emissions reduction, water usage and cuttings disposal and regulatory compliance and reporting; the rotary steerable systems versus mud motors, real-time downhole tool adjustments, high-temperature, high-pressure tool selection and novel drilling fluids; the value stream mapping of drilling operations, eliminating non-value-added activities, standard operating procedures and checklists and continuous improvement culture; the risk management and safety integration; and the implementation roadmap and change management.

Course Objectives

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

- Apply and gain an in-depth knowledge on drilling engineering, drilling efficiency, problem-solving and optimization techniques
- Discuss drilling efficiency, well planning and design for efficiency, drill bit selection and hydraulics
- Illustrate drill string and bottom hole assembly (BHA) design, mud systems and hole cleaning and rig selection and equipment capabilities
- Recognize real-time data acquisition, drilling performance metrics and visualization and analytics tools
- Carryout downhole dynamics and vibration analysis, drilling hydraulics monitoring and drill bit tracking and optimization
- Employ structured problem-solving techniques, identify stuck pipe and hole problems and apply well control and kick management
- Identify wellbore stability challenges, apply torque and drag optimization and describe cementing and well integrity issues
- Recognize automated drilling systems, predictive analytics and machine learning and pressure management strategies
- Apply rig power consumption monitoring, fuel optimization and emissions reduction, water usage and cuttings disposal and regulatory compliance and reporting
- Identify rotary steerable systems versus mud motors, real-time downhole tool adjustments, high-temperature, high-pressure tool selection and novel drilling fluids
- Illustrate value stream mapping of drilling operations, eliminating non-value-added activities, standard operating procedures and checklists and continuous improvement culture
- Apply risk management and safety integration as well as implementation roadmap and change management

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 covers systematic techniques on drilling efficiency, problem solving and optimization techniques for drilling engineers, well engineers and well planners, drilling supervisors, toolpushers, operations engineers involved in well delivery, field engineers, drilling superintendents and managers, technical support staff in drilling departments, project engineers responsible for drilling operations, contract engineers overseeing drilling services, HSE professionals working closely with drilling operations and other technical staff.

Course Date/Venue

Session(s)	Date	Venue
1	May 31-June 04, 2026	Pierre Lotti Meeting Room, Movenpick Hotel Istanbul Golden Horn, Istanbul, Turkey
2	July 20-24, 2026	Meeting Room 4, Four Seasons Hotel Cairo at Nile Plaza, Corniche El Nil, Garden City, Cairo, Egypt
3	August 17-21, 2026	Meeting Plus 9, City Centre Rotana, Doha, Qatar
4	October 18-22, 2026	Tamra Meeting Room, Al Bandar Rotana Creek, Dubai, UAE
5	November 23-27, 2026	Ruben Boardroom, The Rubens at The Palace, Buckingham Palace Road, London, United Kingdom
6	December 14-18, 2026	Salon Expo, NH Hotel Plaza de Armas, Seville, Spain
7	January 03-07, 2027	Meeting Room 4, Four Seasons Hotel Cairo at Nile Plaza, Corniche El Nil, Garden City, Cairo, Egypt
8	February 07-11, 2027	Tamra Meeting Room, Al Bandar Rotana Creek, Dubai, UAE
9	March 21-25, 2027	Ruben Boardroom, The Rubens at The Palace, Buckingham Palace Road, London, United Kingdom

Course Fee

Doha	US\$ 8,500 per Delegate. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
Istanbul	US\$ 8,500 per Delegate + VAT . This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
Dubai	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.
London	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.
Seville	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.
Cairo	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

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. 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 Sweetening**, **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.

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 course 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 Drilling Efficiency Defining ROP (Rate of Penetration) & its Importance • Key Performance Indicators (KPIs) in Drilling • Cost Per Foot & its Drivers • Benchmarking Against Industry Best Practices
0930 – 0945	Break
0945 – 1030	Well Planning & Design for Efficiency Borehole Trajectory Optimization (Vertical versus Directional) • Hole Section Sizing & Casing Program • Geomechanical Considerations (Stress Regimes, Rock Strength) • Formation Evaluation Inputs to Drilling Design
1030 – 1130	Drill Bit Selection & Hydraulics Types of Drill Bits & Their Applications (PDC, Roller Cone, Hybrid) • Bit Hydraulics: Optimizing Nozzles & Flow Rates • Erosion & Bit Life Management • Hydraulics Modeling & Pressure Loss Calculation
1130 – 1230	Drill String & Bottom Hole Assembly (BHA) Design BHA Components & their Roles (Stabilizers, Jars, Subs) • String Configuration for Directional Control versus Efficiency • Vibration Mitigation Through BHA Tuning • Torque & Drag Considerations
1230 – 1245	Break
1245 – 1330	Mud Systems & Hole Cleaning Properties of Drilling Fluids Affecting ROP (Viscosity, Density) • Solids Control Equipment & Practices • Cuttings Transport Theory & Cleaning Optimization • Fluid Loss Control & Wellbore Stability



1330 - 1420	Rig Selection & Equipment Capabilities Matching Rig Horsepower & Torque to Well Requirements • Top Drive versus Rotary Table Efficiencies • Automated Drilling Systems Overview • Maintenance Practices for Minimizing Downtime
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 - 0845	Real Time Data Acquisition Surface Parameters (Weight on Bit, Rotary Speed, Pump Pressure) • Down-Hole Telemetry Systems (MWD, LWD) • Data Quality & Communications Challenges • Integration of Multi Source Data
0845 - 0930	Drilling Performance Metrics Mechanical Specific Energy (MSE) Calculation • Drilling Efficiency Ratio (DER) & Drilling Depreciation Ratio (DDR) • Six Sigma & Statistical Process Control for Drilling • Automated KPI Dashboards
0930 - 0945	Break
0945 - 1100	Visualization & Analytics Tools Commercial & In-House Software Platforms • Trend Analysis for Proactive Decision Making • Custom Scripting & Data Mining Techniques • Alert Thresholds & Anomaly Detection
1100 - 1230	Downhole Dynamics & Vibration Analysis Identification of Stick-Slip, Whirl & Bit Bounce • Sensor Placement & Signal Processing • Mitigation Strategies (BHA Changes, Flow Adjustments) • Case Examples of Vibration-Induced Inefficiencies
1230 - 1245	Break
1245 - 1330	Drilling Hydraulics Monitoring Real Time Pressure & Flow Modelling • Identifying & Diagnosing Hydraulic Restrictions • Dynamic Kill & Circulating Procedures • Use of Distributed Pressure Sensors
1330 - 1420	Drill Bit Tracking & Optimization Bit Run Reporting & Life Cycle Tracking • Bit Steering versus Bit Efficiency Trade-Offs • Bit Performance Prediction Models • Continuous Improvement through Post-Job Reviews
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 - 0845	Structured Problem-Solving Techniques PDCA (Plan-Do-Check-Act) Cycle in Drilling Context • Root Cause Analysis (5 Whys, Fishbone Diagrams) • Failure Mode & Effects Analysis (FMEA) • Lessons Learned Databases
0845 - 0930	Stuck Pipe & Hole Problems Types of Stuck Pipe Incidents & Causes • Prevention Strategies (Spotting Fluids, Torque Management) • Free-Point Determination & Fishing Basics • Case Study: Successful Stuck-Pipe Recovery



0930 – 0945	Break
0945 – 1100	Well Control & Kick Management Early Detection of Kicks Using Drilling Parameters • Shut-in & Kill Procedures • Circulation versus Bleed Off Methods • Pressure Management in Depleted or Fractured Zones
1100 – 1230	Wellbore Stability Challenges Identifying Instability Risks (Shales, Washes, Losses) • Drilling Window Determination • Loss-Circulation Material (LCM) Selection & Placement • Borehole Strengthening Techniques
1230 – 1245	Break
1245 – 1330	Torque & Drag Optimization Calculating Expected Torque & Drag • Friction Factor Measurement • Use of Lubricants & Friction Reducers • Model Validation with Down Hole Data
1330 – 1420	Cementing & Well Integrity Issues Cement Slurry Design for Efficient Zonal Isolation • Mud Removal & Centralization Best Practices • Cement Placement Verification (Tags, Pressure Tests) • Remedial Cementing Techniques
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 – 0845	Automated Drilling Systems Closed Loop Drilling Control Fundamentals • Surface Automation (Auto ROP, WOB Control) • Downhole Automation (Drilling Jars, Toolface Control) • Human-Machine Interface & Change Management
0845 – 0930	Predictive Analytics & Machine Learning Data Preprocessing for Model Training • Common ML Algorithms in Drilling (Regression, Clustering) • Predictive Maintenance of Drilling Equipment • Implementation Challenges & Success Factors
0930 – 0945	Break
0945 – 1100	Pressure Management Strategies Managed Pressure Drilling (MPD) Techniques • Dual-Gradient Drilling Advantages • Surface Back-Pressure Control • Case Study: MPD Efficiency Gains
1100 – 1230	Energy Management & Environmental Considerations Rig Power Consumption Monitoring • Fuel Optimization & Emissions Reduction • Water Usage & Cuttings Disposal • Regulatory Compliance & Reporting
1230 – 1245	Break
1245 – 1330	Advanced BHA & Tool Innovations Rotary Steerable Systems versus Mud Motors • Real-Time Downhole Tool Adjustments • High-Temperature, High-Pressure Tool Selection • Novel Drilling Fluids (Nanoparticle Additives, Polymers)



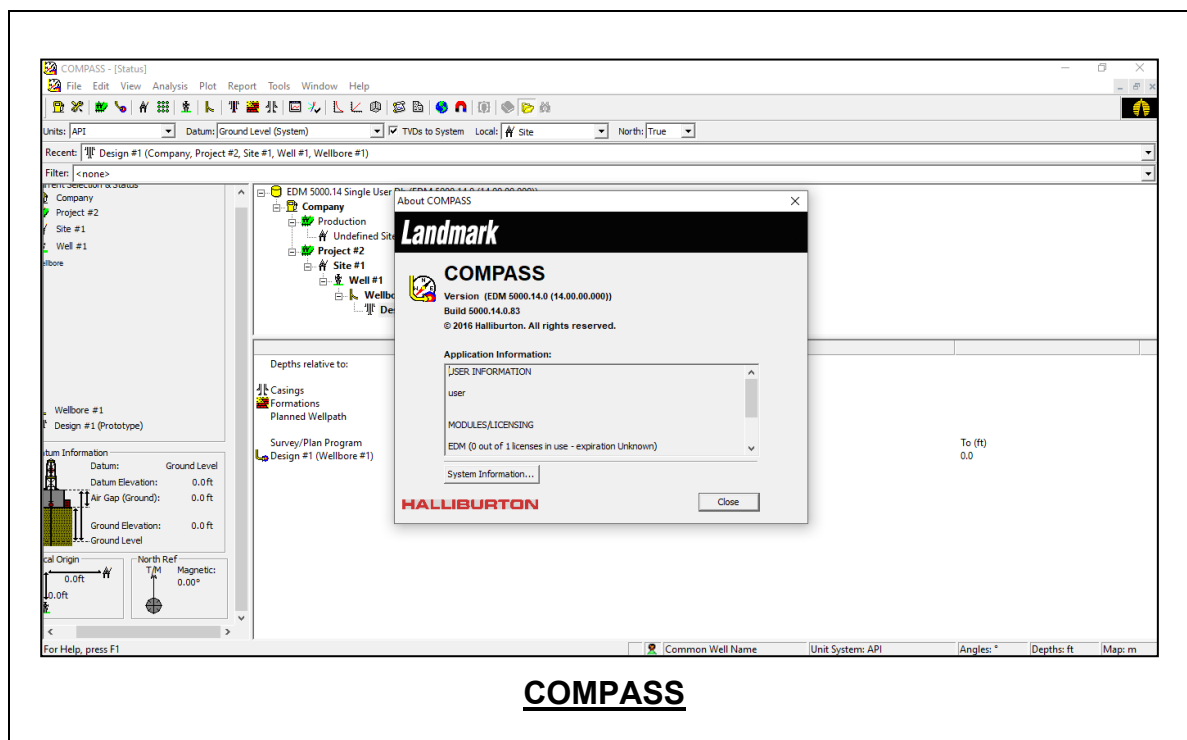
1330 - 1420	Operational Excellence & Lean Drilling Value Stream Mapping of Drilling Operations • Eliminating Non-Value-Added Activities • Standard Operating Procedures & Checklists • Continuous Improvement Culture
1420 - 1430	Recap Using this Course Overview, the Instructor(s) will Brief Participants 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 - 0845	Comprehensive Well Efficiency Case Studies Onshore versus Offshore Drilling Efficiency Comparisons • High-Angle & Horizontal Well Optimization • Deepwater Drilling Performance Lessons • Cost-Benefit Analysis of Efficiency Projects
0845 - 0930	Simulation & Digital Twin Applications Building a Digital Twin of the Drilling System • Scenario Testing & what if Analysis • Integrating Real Time Data for Live Simulation • Measuring ROI from Digital Twin Projects
0930 - 0945	Break
0945 - 1100	Project Workshops & Hands-On Exercises Group Exercise: Identify & Solve a Drilling Inefficiency • Use of Simulators for Real Time Optimization Drills • Developing Action Plans & Presenting Solutions • Peer Review & Facilitator Feedback
1100 - 1230	Risk Management & Safety Integration Linking Efficiency Gains with HSE Performance • Safety Risk Assessments for Optimization Changes • Emergency Response Planning in Optimized Operations • Ensuring Regulatory & Stakeholder Alignment
1230 - 1245	Break
1245 - 1345	Implementation Roadmap & Change Management Phased Rollout of Optimization Initiatives • Stakeholder Engagement & Training Plans • KPI Tracking & Governance Structures • Sustaining Improvements through Audits
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

Simulators (Hands-on Practical Sessions)

Practical sessions will be organized during the workshop for delegates to practice the theory learnt. Delegates will be provided with an opportunity to carryout various exercises using one of our state-of-the-art simulators “COMPASS” and “PROSPER” software.





PROSPER

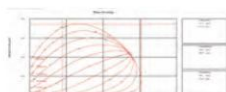


MULTIPHASE WELL AND PIPELINE NODAL ANALYSIS

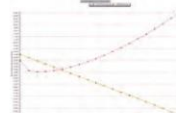
WELL AND PIPELINE MODELS



FULLY COMPOSITIONAL



INFLOW/OUTFLOW RESPONSE



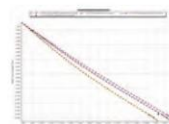
STEAM WELLS



FLOW ASSURANCE



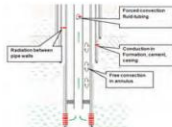
OUTFLOW (VLPs) MODELS



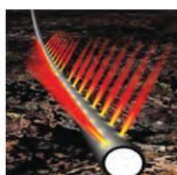
ARTIFICIAL LIFT SYSTEMS



THERMAL MODELLING



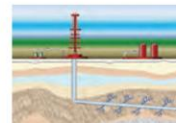
PERFORATION DESIGN AND PERFORMANCE



MULTILATERAL COMPLETIONS



INFLOW (IPRs) MODELS



Course Coordinator

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