# COURSE OVERVIEW DE0563
# AI in Drilling Engineering

**Course Title**
AI in Drilling Engineering


**Course Date/Venue**
Session 1: May 25-29, 2025/Tamra Meeting Room, Al Bandar Rotana Creek, Dubai UAE
Session 2: September 22-26,2025/Glasshouse Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE

**Course Reference**
DE0563

**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 Artificial Intelligence in Drilling Engineering. It covers the AI-driven data analytics for drilling operations and machine learning for drilling optimization; the AI for well planning and trajectory optimization; the drill bit selection and performance optimization; the AI-enabled real-time drilling monitoring, predictive drilling performance analysis and drilling fluid optimization; and the AI for early kick detection and well control, downhole tool optimization and automated drilling rig operations.

Further, the course will also discuss the AI for drilling equipment health monitoring, AI-driven robotic drilling systems, automated mud logging and cutting analysis; the digital twins in drilling and the AI for predictive modeling of downhole conditions and AI-powered decision support systems; the AI for drilling risk assessment and hazard detection, well integrity monitoring and enhanced blowout prevention and control; and the AI for environmental monitoring in drilling operations and AI for offshore drilling operations.

During this interactive course, participants will learn the AI trends and innovations in drilling engineering and AI for intelligent decision-making in drilling; the AI-powered IoT sensors for real-time monitoring and AI driven real-time drilling parameter adjustment; the AI-powered cost optimization in drilling and AI for reducing non-productive time (NPT); and the AI-driven predictive scheduling of drilling operations and AI for optimizing drilling fluids and material consumption.

## Course Objectives

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

- Apply and gain an in-depth knowledge on artificial intelligence in drilling engineering
- Discuss artificial intelligence (AI) and its role in drilling
- Carryout AI-driven data analytics for drilling operations and machine learning for drilling optimization
- Apply AI for well planning and trajectory optimization including drill bit selection and performance optimization
- Employ AI-enabled real-time drilling monitoring, predictive drilling performance analysis and drilling fluid optimization
- Implement AI for early kick detection and well control, downhole tool optimization and automated drilling rig operations
- Carryout AI for drilling equipment health monitoring, AI-driven robotic drilling systems, automated mud logging and cutting analysis
- Recognize digital twins in drilling and apply AI for predictive modeling of downhole conditions and AI-powered decision support systems
- Apply AI for drilling risk assessment and hazard detection, well integrity monitoring and enhanced blowout prevention and control
- Employ AI for environmental monitoring in drilling operations and AI for offshore drilling operations
- Carryout AI trends and innovations in drilling engineering and AI for intelligent decision-making in drilling
- Discuss AI-powered IoT sensors for real-time monitoring and AI driven real-time drilling parameter adjustment
- Apply AI-powered cost optimization in drilling and AI for reducing non-productive time (NPT)
- Carryout AI-driven predictive scheduling of drilling operations and AI for optimizing drilling fluids and material consumption

## 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 artificial intelligence in drilling engineering for operations managers, project managers, drilling engineers, petroleum engineers, data scientists and machine learning engineers, geologists and geophysicists, maintenance engineers, automation engineers, software engineers, industry consultants and advisors, safety and risk management professionals, energy industry stakeholders.

## 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.

**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:

**Mr. Samer Shukri**, BSc, IWCF, is a **Senior Drilling & Petroleum Engineer** with over **25 years** of **offshore** and **onshore** experience in the **Oil** & **Gas**, **Refinery** & **Petrochemical** industries. His wide expertise includes **Workovers & Completions**, **Well Completion** Design & Operations, **Well Intervention**, **Well Life Cyle**, **Well Stimulation** & **Workover** Planning, **Workover** Practices, **Workover** Operations, **Well Integrity** System, **Well Control**, **Oil & Water Wells**, **Workover/Remedial** Operations & **Heavy Oil** Technology, Plug & Abandonment of **Oil & Gas Wells**, **Petroleum** Engineering, **Open Hole & Cased Hole Logs**, **Petroleum Risk & Decision** Analysis, **Well Testing** Analysis, **Stimulation** Operations, **Coiled Tubing** Operations, **Coiled Tubing Equipment**, **Rigless** Operations, **Reserves Evaluation**, **Reservoir Fluid** Properties, **Reservoir** Engineering & Simulation Studies, **Reservoir** Monitoring, **Geology & Reservoir** Engineering, **Artificial Lift Design**, **Gas** Operations, **Applied Water** Technology, **Oil & Gas Production**, **X-mas Tree** & **Wellhead** Operations & **Testing**, **Wellbore Design & Construction**, **Drilling Fluids & Solids Control**, **Drilling Fluids & Cementing** Operations, **Drilling Practices & Techniques**, **Well Control & Blow Out Prevention**, **Stuck Piping & Fishing** Operations, **Rig Equipment** Maintenance & Inspection, **Rigging & Lifting** Operations, **WellCAP** Driller, **WellCAP** Supervisor, **Artificial Lift** Systems (**Gas Lift**, **ESP** and **Rod Pumping**), **Well Cementing**, **Oil Field Cementing**, **Production Optimization**, **PLT** Correlation, **Slickline** Operations, **Well Testing**, **Production Logging**, **Wireline Logging**, **Wireline** Technology, **Wireline Fishing** Operations, **Project Evaluation** & **Economic Analysis**. Further, he is also well-versed in Marine Environment Protection, Maritime Professional Training, Operational Audit, Improvement, Planning & Management, Climate Change & Emissions Trading Services, International Trade & Shipping, **Fitness for Service-API 579**, **Refining Process & Petroleum** Products, **OSHA** (General Industry & Construction), **IOSH** (Managing Safely, Working Safely), **HSE** Standards & Procedures in the Oilfield, HSE Principles, Incident Prevention & Incidents, Working at Height, **First Aid**, **H2S** Awareness, Defensive Driving, Risk Assessment, Authorized Gas Tester (**AGT**), Confined Space Entry (**CSE**), Root Cause Analysis (**RCA**), Negotiation & Persuasion Skills, **ISO-9001** Quality Management System (**QMS**), ISO-14001 Environmental Management System (**EMS**), **ISO-45001** Occupational Health and Safety Management System (**OHSMS**), **ISO-17020** Conformity Assessment, ISO/TS-29001 Quality Management System, **IOS-50001**-Energy Management System (**EnM**S) and Basic Offshore Safety Induction & Emergency. Currently, he is actively involved in **Project Management** with special emphasis in **commissioning of new wells**, **completion design**, **well integrity** management, **production technology** and field optimization, performing conceptual studies, economic analysis with risk assessment and field development planning.

During his career life, Mr. Samer has gained his field experience through his various significant positions and dedication as the **Senior Production Engineer**, **Well Services Department Head**, **Senior Well Services Supervisor**, **Senior Well Integrity Engineer**, **Senior HSE Engineer**, **Well Services Supervisor**, **Drilling/Workover Supervisor**, **International oil & Gas Trainer**, **Leadership & Management Instructor** and **Senior Instructor/Trainer** from the various international companies such as the ADCO, Al Furat Petroleum Company (AFPC), Syrian Petroleum Company (SPC), Petrotech, Global Horizon-UK, HDTC, Petroleum Engineers Association, STC, Basra University and Velesto Drilling Academy, just to name a few.

Mr. Samer has **Bachelor's** degree in **Petroleum Engineering**. Further, he is an **Accredited IWCF Drilling & Well Intervention Instructor**, a **Certified Instructor/Trainer**, a **Certified Train-the-Trainer** and further delivered innumerable training courses, seminars, conferences and workshops worldwide.

## 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 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.

## 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***

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| *0730 – 0800* | *Registration & Coffee* |
| *0800 – 0815* | *Welcome & Introduction* |
| *0815 – 0830* | ***PRE-TEST*** |
| *0830 – 0930* | ***Understanding AI & Its Role in Drilling***<br>*What is Artificial Intelligence (AI)? • Evolution of AI in Oil & Gas Drilling • AI versus Traditional Drilling Methods • Key AI Technologies (Machine Learning, Deep Learning, Computer Vision, IoT)* |
| *0930 – 0945* | *Break* |
| *0945 – 1045* | ***AI-Driven Data Analytics for Drilling Operations***<br>*Importance of Big Data in Drilling • AI for Real-Time Drilling Data Interpretation • AI-Driven Decision-Making and Optimization • Case Studies of AI analytics in Drilling* |
| *1045 – 1130* | ***Machine Learning for Drilling Optimization***<br>*Introduction to Machine Learning (ML) in Drilling Engineering • Supervised versus Unsupervised Learning for Drilling Data • Predictive Models for Drilling Performance Enhancement • AI for Real-Time Drilling Parameter Adjustments* |
| *1130 – 1230* | ***AI for Well Planning & Trajectory Optimization***<br>*AI-Driven Well Trajectory Design • Machine Learning for Optimal Wellbore Placement • AI-Powered Real-Time Geosteering • Predicting Drilling Hazards with AI* |

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| 1230 – 1245 | Break |
| 1245 – 1330 | ***AI for Drill Bit Selection & Performance Optimization***<br>*AI-Based Drill Bit Wear Prediction • Machine Learning for Selecting the Best Bit for Formations • AI for Optimizing Rate of Penetration (ROP) • AI-Driven Drill Bit Failure Analysis* |
| 1330 – 1420 | ***Hands-On: AI-Based Data Analytics for Drilling***<br>*Collecting & Preprocessing Drilling Data • Applying AI Models to Optimize Drilling Parameters • Real-Time Data Visualization Using AI Tools • AI-Driven Decision-Making for Drilling Efficiency* |
| 1420 – 1430 | ***Recap***<br>*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**

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| 0730 – 0830 | ***AI-Enabled Real-Time Drilling Monitoring***<br>*Importance of Real-Time Data in Drilling • AI-Powered Real-Time Wellbore Stability Analysis • Predicting Drilling Fluid Losses Using AI Models • AI for Real-Time Drilling Risk Assessment* |
| 0830 – 0930 | ***AI for Predictive Drilling Performance Analysis***<br>*Machine Learning for Predicting Drilling Efficiency • AI-Powered Torque & Drag Analysis • AI Models for Wellbore Pressure Prediction • Predicting Lost Circulation Events Using AI* |
| 0930 – 0945 | Break |
| 0945 – 1030 | ***AI for Drilling Fluid Optimization***<br>*AI-Driven Mud Rheology Prediction • Machine Learning for Drilling Fluid Contamination Detection • AI-Powered Drilling Fluid Performance Analysis • AI-Based Decision-Making for Mud Weight Optimization* |
| 1030 – 1100 | ***AI for Early Kick Detection & Well Control***<br>*AI-Driven Early Kick Detection Algorithms • AI for Real-Time Pressure • AI-Assisted Well Control Decision Support Systems• Predicting Well Blowouts Using Machine Learning* |
| 1230 – 1245 | Break |
| 1245 – 1330 | ***AI for Downhole Tool Optimization***<br>*AI for Drill String Vibration Analysis • Predicting Tool Failures Using AI • AI-Based Motor Performance Analysis • AI for MWD/LWD Tool Performance Enhancement* |
| 1330 – 1420 | ***Hands-On: AI-Driven Real-Time Drilling Optimization***<br>*Implementing AI for Real-Time ROP Optimization • AI-Based Predictive Torque and Drag Modeling • AI-Powered Early Kick Detection System • Real-Time AI Analytics for Wellbore Stability* |
| 1420 – 1430 | ***Recap***<br>*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**

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| 0730 – 0830 | ***AI for Automated Drilling Rig Operations***<br>*Introduction to Autonomous Drilling Rigs • AI-Driven Rig Floor Automation • AI-Based Pipe Handling and Tripping Optimization • AI for Rig Power System Optimization* |

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| *0830 – 0930* | ***AI for Drilling Equipment Health Monitoring***<br>*AI for Early Detection of Equipment Failure • Predictive Maintenance for Rig Components • AI-Powered Vibration Analysis for Rotating Equipment • AI for Drillstring Fatigue Analysis* |
| *0930 – 0945* | *Break* |
| *0945 – 1045* | ***AI-Driven Robotic Drilling Systems***<br>*AI-Powered Robotic Drilling Assistants • AI-Driven Autonomous Drill Pipe Handling • AI for Automated Casing & Cementing Operations • Case Studies on AI-Powered Robotic Drilling* |
| *1045 – 1230* | ***AI for Automated Mud Logging & Cuttings Analysis***<br>*AI for Real-Time Lithology Classification • AI-Powered Drilling Cuttings Analysis • AI-Based Real-Time Drilling Parameter Correlation • AI for Early Detection of Formation Fluid Influx* |
| *1230 – 1245* | *Break* |
| *1245 – 1330* | ***AI-Enabled Digital Twins for Drilling Optimization***<br>*What are Digital Twins in Drilling? • AI-Driven Real-Time Drilling Simulation • AI for Predictive Modeling of Downhole Conditions • AI-Powered Decision Support Systems* |
| *1330 - 1420* | ***Hands-On: AI-Driven Drilling Automation***<br>*Implementing AI Models for Automated Drilling Performance Monitoring • AI-Powered Early Detection of Drilling Equipment Failures • AI for Robotic Drilling Optimization • AI-Based Predictive Modeling for Mud Logging* |
| *1420 – 1430* | ***Recap***<br>*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***

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| *0730 – 0830* | ***AI for Drilling Risk Assessment & Hazard Detection***<br>*AI-Powered Risk Analysis Models • Machine Learning for Incident Prediction • AI-Driven Root Cause Analysis for Drilling Accidents • AI for HSE Compliance Monitoring* |
| *0830 – 0930* | ***AI for Well Integrity Monitoring***<br>*AI-Powered Casing & Cementing Integrity Analysis • AI for Downhole Leak Detection • AI-Driven Annular Pressure Monitoring • Predictive Analytics for Well Integrity Failures* |
| *0930 – 0945* | *Break* |
| *0945 – 1045* | ***AI-Enhanced Blowout Prevention & Control***<br>*AI-Powered Predictive Blowout Modeling • AI-Driven Well Pressure Monitoring • AI for Real-Time Kick Detection • AI-Based Decision-Making for Well Control* |
| *1045 – 1230* | ***AI for Environmental Monitoring in Drilling Operations***<br>*AI-Driven Emissions Tracking in Drilling Operations • AI for Real-Time Monitoring of Drilling Waste Disposal • AI-Powered Noise & Vibration Analysis • AI for Compliance with Environmental Regulations* |
| *1230 – 1245* | *Break* |
| *1245 – 1330* | ***AI for Offshore Drilling Operations***<br>*AI-Driven Remote Monitoring of Offshore Rigs • AI-Powered Weather & Wave Prediction • AI for Subsea Equipment Monitoring • AI-Driven Predictive Maintenance for Offshore Platforms* |

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| 1330 – 1420 | ***Hands-On: AI for Drilling Safety & Risk Management***<br>*Implementing AI-Powered Predictive Risk Analysis • AI-Based Real-Time Environmental Monitoring • AI for Automated Blowout Detection • AI-Driven Predictive Well Integrity Monitoring* |
| 1420 – 1430 | ***Recap***<br>*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***

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| 0730 – 0830 | ***AI Trends & Innovations in Drilling Engineering***<br>*AI for Advanced Predictive Analytics • AI-Powered Digital Twins for Drilling Optimization • AI in Geothermal & Unconventional Drilling • Future Role of AI in Reducing Drilling Costs* |
| 0830 - 0930 | ***AI for Intelligent Decision-Making in Drilling***<br>*AI-Powered Real-Time Decision Support Systems • AI-Driven Drilling Operation Optimization Models • AI for Integrating Drilling and Reservoir Data • AI-Assisted Automated Reporting for Drilling Engineers* |
| 0930 – 0945 | *Break* |
| 0945 – 1100 | ***AI & IoT Integration for Smart Drilling***<br>*AI-Powered IoT Sensors for Real-Time Monitoring • AI-Driven Real-Time Drilling Parameter Adjustment • AI for Predictive Maintenance of IoT-Enabled Drilling Systems• AI-Driven Automation of Smart Drilling Rigs* |
| 1100 - 1230 | ***AI for Reducing Drilling Costs & Improving Efficiency***<br>*AI-Powered Cost Optimization in Drilling • AI for Reducing Non-Productive Time (NPT) • AI-Driven Predictive Scheduling of Drilling Operations • AI for Optimizing Drilling Fluids and Material Consumption* |
| 1230 - 1245 | *Break* |
| 1245 – 1345 | ***Hands-On: AI-Powered Drilling Engineering Solutions***<br>*Implementing AI-Driven Real-Time Drilling Optimization • AI-Powered Predictive Maintenance for Drilling Equipment • AI-Enhanced Drilling Risk Assessment Models • AI-Driven Digital Twin Modeling for Well Performance* |
| 1345 – 1400 | ***Course Conclusion***<br>*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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