Drilling Engineering for Non-Drilling Engineers Training

Course Price

£2750

Course Description

This short course is intended for participants in the Oil and Gas industry with or without prior basic knowledge and understanding of drilling. Participants would be introduced to the first-hand and essential concepts and principles of drilling, the process and the equipment. Basic and fundamental calculations of drilling are covered in this course as well. Case studies will be presented together with videos on the processes involved.

Course Objectives

- To introduce participants to basic concepts, theories, principles and overview of drilling
- Expose participants to the various drilling facilities onshore and offshore and rig set-up
- Introduction to the stake holders involved in drilling
- Introduce participants to the history of drilling, drilling terminologies and drilling methodologies
- Explain the purpose and essentials of drilling
- Show participants the basic concept of drilling operation and process
- Present and explain the fundamental and basic calculations in drilling
- Introduce participants to major consideration such as well control
- Identify potential drilling problems, means for prevention and mitigation

Who Should Attend

This short course is intended for personnel with no drilling background, knowledge or experience. It is a very basic and introductory course designed to expose and introduce potential candidates to drilling engineering concepts and fundamentals.

Course Content

Fundamentals of Petroleum
Stakeholders involved in drilling and drilling contracts
Drilling contracts and stakeholders
Onshore and Offshore Drilling Units
History of drilling
Rotary drilling
Rig set-up
Drill string and Bottom hole assembly concept
Drilling Process
Concept of Drilling
Fundamental Drilling Calculations
Drilling fluids and cements
Casing design
Well control
Introduction to Directional Drilling

Day 1

Introduction, Terminology, Drilling Context
Introductions
A bit of oil history – Terminology of Petroleum & of Drilling
Overall drilling process
Drilling planning overview
Oil prices & drilling
Major drilling accomplishments & challenges

Essentials of Geology
Hydrocarbon formation
Key elements of economic reservoir, rocks, traps, seals
Geological and geophysical information
VIDEO-1 : Origins of Petroleum

Drilling Rigs & Drilling Systems
Onshore – Offshore rigs, characteristics
Drilling challenges
Rig components – Well classification
Power system – Hoisting system
Circulation system / pumps
Control system / BOPs
Monitoring system
VIDEO-2: Drilling Rigs

Drilling Costs
Drilling cost estimation – Types of costs
Acquisition For Expenditure (AFE)
QUIZ -1- Test your knowledge on today’s lecture

Day 2

Drilling Fluids & Drilling hydraulics
Drilling fluid types – Uses
Fluid properties – additives
Rheology of drilling fluids
Static / dynamic conditions / circulation
Rheological models, pressure losses
Bit hydraulics
Cuttings transport issues
EXERCISE: Determine drilling fluid density

CASE STUDY: Basics of drilling fluid design

Abnormal Pressures, Kicks & Kick Control
Sedimentary rocks – Overpressure generation
Pore pressure / Fracture pressure estimation
Kick definition / Kick sequence
Kick detection
Kick control methods, BOPs (video)
VIDEO-3: Kicks & kick control

EXERCISE: Kick control example

Casing Design
Purpose of casing design
Casing / hole diameter selection
Burst / Collapse pressure calculations
Casing depth estimation
Mud weight estimation

Cementing & Cement Job Design
Cementing process
Cements & types of cements, additives
Cement placement / Cementing problems
Cement job evaluation
EXERCISE: Cement slurry density & yield calculation

QUIZ-2 – Test your knowledge on today’s lectures

Day 3

The drill string
Drill string components
Drilling bits, Bit wear / Bit selection
Drill collars, characteristics & selection, Neutral point
Drill pipe characteristics
Bottom Hole Assembly

Directional & Horizontal Drilling
Purpose, history & types of deviated wells
Inclination & azimuth
MWD
Horizontal / ERD wells, Multilaterals
Coil-Tubing-Drilling
VIDEO-4: Directional Drilling

Well Logging & Completions
Logging
Mud Log
Open hole logs
RFT, Drill stem testing
Basic components & function of completions
Stimulation

Drilling Problems & Advanced Techniques
Types of drilling problems, severity
Lost circulation – Stuck pipe – Junk in hole
Surface / downhole measurements / problem prevention
Managed Pressure Drilling / Casing Drilling / Dual Gradient Drilling
Drilling safety
VIDEO-5: Managed Pressure Drilling

CASE STUDY: Lost Circulation Problem, identification & solution

FINAL QUIZ: post-assessment of knowledge level on Basic Drilling Engineering for non Engineers

CPD Unit

Continuing Professional Development

21 HOURS CPD