

Basic Mud Logging Course Module

Course Title: Basic Mud Logging

Duration: 3 Weeks

Fee: NGN650,000

Target Audience: Entry-level mud loggers, geology students, drilling personnel, and field engineers.

Prerequisites: Basic knowledge of geology and drilling operations is beneficial but not mandatory.

Module 1: Introduction to Mud Logging

Objective:

Understand the fundamental role of mud logging in drilling operations.

Learn the importance of real-time data monitoring.

Topics Covered:

What is mud logging?

The history and evolution of mud logging.

The role of a mud logger in oil and gas exploration.

Key objectives of mud logging in drilling operations.

Overview of a mud logging unit and its components.

Module 2: Drilling and Formation Evaluation Basics

Objective:

Gain an understanding of drilling processes and how formations are evaluated.

Topics Covered:

Basic drilling techniques and their impact on mud logging.

Wellbore stability and formation pressures.

Lithology and rock properties in well evaluation.

Hydrocarbon detection methods in mud logging.

Module 3: Drilling Fluids and Cuttings Analysis

Objective:

Understand the properties and functions of drilling fluids in mud logging.

Learn the techniques used in cuttings analysis.

Topics Covered:

Types of drilling fluids and their properties.

The importance of mud weight, viscosity, and filtration control.

Collection, washing, and examination of cuttings.

Methods for cuttings description (texture, color, mineral composition).

Fluorescence and solvent cut tests for hydrocarbon detection.

Module 4: Mud Logging Equipment and Sensors

Objective:

Familiarize with the key equipment and sensors used in mud logging operations.

Topics Covered:

Gas detection and chromatography.

Pressure, temperature, and flow sensors.

Mud logging software and data acquisition systems.

Calibration and maintenance of logging tools.

Module 5: Gas Detection and Interpretation

Objective:

Learn about gas detection techniques and how to interpret gas readings.

Topics Covered:

Types of gases monitored in mud logging (Methane, Ethane, Propane, etc.).

Gas extraction techniques from drilling fluids.

Real-time monitoring of gas levels.

Interpretation of gas trends and anomalies.

Module 6: Formation Pressure and Well Control Indicators

Objective:

Recognize early warning signs of well control issues.

Topics Covered:

Kick detection and well control principles.

Abnormal pressure detection from mud logging data.

Cuttings shape and size as indicators of wellbore stability.

Pit volume monitoring and gain/loss trends.

Module 7: Report Writing and Data Interpretation

Objective:

Develop skills in generating detailed and accurate mud logging reports.

Topics Covered:

Types of reports in mud logging (daily, lithology, gas analysis).

Data visualization and interpretation.

Common terminologies used in reporting.

Best practices in report accuracy and clarity.

Module 8: Health, Safety, and Environmental (HSE) Practices in Mud Logging

Objective:

Understand HSE requirements and risk management in mud logging operations.

Topics Covered:

Safety procedures in a mud logging unit.

Handling of chemicals and hazardous substances.

Emergency response planning.

Environmental regulations and waste management.

Module 9: Case Studies and Field Applications

Objective:

Apply theoretical knowledge to real-world mud logging scenarios.

Topics Covered:

Case studies of drilling operations and their impact on mud logging.

Common challenges and troubleshooting in mud logging.

Hands-on exercises in sample collection and analysis.

Group discussions on best practices in mud logging.

Assessment & Certification

Quizzes & Tests: Periodic assessments to evaluate understanding.

Practical Exercises: Hands-on training in sample collection and gas analysis.

Final Examination: Written and practical evaluation.

Certification: Awarded upon successful completion of the course.