

DATA ANALYTICS FOR DRILLING OPTIMIZATION

DRL042

COURSE OVERVIEW

Most difficult issues regarding the upstream oil industry are data management, quantifying uncertainty in the subsurface, and risk assessment of strategies for field engineering and development. Oil and Gas industry is now in the sea of data, where the big data is collected from virtually every sensor imaginable, and this data can provide us with the ways and means to go above and beyond old school of traditional deterministic and interpretive studies. In the Big Data era, the clustering techniques, neural networks, fuzzy-logics, genetic algorithms and other heuristics are becoming the new norm for data driven modeling of all the elements of the upstream oil and gas industry. Participants to this course will receive a thorough training on the subjects covered by the seminar outline with the instructor utilizing a variety of proven adult learning teaching and facilitation techniques.

COURSE OBJECTIVES

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

- Perform the data mining and the fusion of data.
- Understand how to implement the Big Data Analytics to improve drilling processes.
- Appreciate Artificial neural network and its geoscience applications.
- Implement data management and data analytics for intelligent reservoir characterization.
- Effectively perform data analysis for production forecasting.
- Implement Block-chain models for Risk Management and production optimization.
- Appreciate the environmental effects of drilling activities.
- Implement techniques to control non-productive time.
- Effectively identify and monitor key performance Indicators (KPI).
- Implement real time management of well construction and optimization for Risk Management and production optimization.

WHO SHOULD ATTEND

Drilling engineer, Drilling supervisor, Risk managers, and Drilling managers

COURSE DURATION

5 Working Days



COURSE OUTLINES

1. Pre course evaluation

2. Mining and Fusion of Data

- Instrumented oil fields
- Current situation in the upstream data analysis
- The SEMMA process- Sampling, Exploring, Modifying, Modeling, and Assessing
- Oilfield Data Management
- Oilfield Exploration Analysis
- Oilfield Appraisal Management

3. Big Data Analytics

- Pattern recognition
- Clustering
- Quantification of data uncertainty and prediction error and confidence interval
- Data repositories in upstream oil and gas
- Exercise: Production Data Quality Control Framework

4. Introduction to IoT and Block-chain

- IoT revolution
- IoT application in oil and gas fields
- Smart sensors for smart oilfields
- Block-chain basics
- Block-chain and Byzantine general problem in Risk Management

5. Drilling Optimization

- Introduction to Drilling Optimization
- Petroleum Rock Mechanics
- Defining of KPIs
- Use of Common Industry KPIs
- Wellbore Stability Analysis
- Rock Strength and Rock Failure

6. Quantitative Risk Assessment

- Risk Management Process
- Cost-time Analysis

- Common Drilling Problems
- Measurement and Evaluation of Risk
- Limit State Function and Probability Failure Function

7. Well Engineering Design and Construction Optimization

- Optimization of a Process and Its Elements
- Drilling Plan
- Rate of Penetration Monitoring
- Other Goals of Well Drilling and Construction
- Technical Limits and Quantum Change in Limits

8. Post course evaluation.

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