Formation - Artificial intelligence in drilling and completion operations

AIDC-EN-P | Présentiel | 5 jours

This course presents comprehensive training in Machine Learning (ML), Data Science (DS) and Artificial Intelligence (AI) applications in drilling operations for engineers in the oil & gas industry. The course focuses on integrating these advanced technologies into the day-to-day work of simulation, well monitoring and drilling optimization. It aims to equip professionals with the knowledge and tools to improve efficiency, reduce risk and enhance real-time decision-making in drilling practices

Niveau

Découverte

Public

- Petroleum industry engineers with experience in well monitoring, simulation and drilling & Completion operations.
- Professionals seeking to understand the value of machine learning and data science to solve industry-specific problems and optimize operations.

Objectifs

Attendees will be able to implement the following skills:

- Understand the fundamentals of machine learning and its relevance to drilling & completion,
- Learn how to apply data science techniques to well monitoring and real-time decision making,
- Learn how to use software tools and platforms for building ML models,
- Discover how AI-driven models can improve operational efficiency, reduce downtime and enhance predictive maintenance,
- Integrate data from sensors and simulation tools to build predictive drilling performance models.

Pédagogie & ressources techniques

- Highly interactive course delivered by experts of the E&P industry.
- Numerous examples and feedbacks from the industry. Numerous videos and animations.

Évaluation des acquis

- Trainees are assessed throughout the training through practical application phases and interactions with the trainer
- A final on-the-spot evaluation may also be carried out at the end of the course and/or at the end of each module using tests designed to verify the learners' understanding and assimilation of the knowledge linked to the training objectives

Prérequis

No prerequisites are necessary to follow this course

Responsable

IFP Training instructors, with expertise in the field and trained in modern teaching methods adapted to the specific needs of learners from the professional world

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Programme

INTRODUCTION TO MACHINE LEARNING (ML) AND DATA SCIENCE IN PETROLEUM ENGINEERING — 1.5 days

Overview of ML/AI concepts (supervised, unsupervised learning, deep learning). Data Science workflow and how it integrates with petroleum engineering practices. Examples of applications of ML/AI in drilling, reservoir modeling, and production forecasting.

DATA COLLECTION AND INTEGRATION IN DRILLING OPERATIONS — 0.25 day

Handling and integrating data from sensors, logging tools, and simulation outputs. Real-time data acquisition and preprocessing for drilling optimization. Understanding the role of Big Data and its potential to transform drilling.

TOOLS AND PLATFORMS FOR ML IN DRILLING — 0.25 day

Overview of software tools and platforms like TensorFlow, Keras, PyTorch, and Scikit-learn for building ML models.

PREDICTIVE ANALYTICS IN DRILLING OPERATIONS — 0.5 day

Using machine learning models to:

- predict drilling parameters such as rate of penetration (ROP), formation pressure,..
- improve predictive maintenance for drilling equipment using sensor data and AI models to reduce unplanned downtime.
- enhance anomaly detection in drilling operations for early identification of risks (e.g., stuck pipe, lost circulation).

DRILLING OPTIMIZATION USING MACHINE LEARNING — 0.5 day

Learn how to define and use:

- Supervised learning models to optimize drill bit selection, mud weight, and drilling speed.
- Reinforcement learning for dynamic adjustments in drilling based on environmental and operational data.
- Real-time decision support systems powered by machine learning to improve wellbore stability and minimize drilling hazards.

SIMULATION-DRIVEN ML MODELS FOR DRILLING — 1 day

Integration of simulation results with machine learning to build better predictive models.
Creating virtual models of the wellbore or drilling environment.
Case studies on using ML models to analyze and enhance drilling simulation results.

AUTOMATING WELL MONITORING AND RISK ASSESSMENT — 0.5 day

Automating well monitoring with:

- AI models that continuously assess well health and recommend corrective actions.
- AI-enhanced risk assessment tools that predict potential blowouts or formation damage.
- Case studies on how machine learning reduces risks and improve outcomes in drilling projects.

AI IN DRILLING AUTOMATION AND CONTROL — 0.5 day

Future trends in automated drilling systems and robotics in well construction.
The role of AI in autonomous drilling: reducing human intervention and increasing efficiency.
Smart rigs and how machine learning could enable the automation of routine tasks.

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Sessions

Pau - Du 15/06/2026 au 19/06/2026 **4570 €/HT**

Pau - Du 16/11/2026 au 20/11/2026 **4570 €/HT**

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Pour vérifier l'accessibilité de cette formation à une personne en situation de handicap, contactez notre référent à l'adresse suivante : referent.handicap@ifptraining.com

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