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OF KNOWLEDGE

## Unconventional Resources - Shale Gas Fundamentals

TRAIN



## Course Overview:

Unconventional resources, such as shale gas, have emerged as a significant source of energy in recent years

Shale gas is found in tight, low-permeability rock formations that require specialized drilling and stimulation techniques to extract

This comprehensive 5-day professional training course will equip engineers, geoscientists, and technical professionals with the essential knowledge and skills to understand, evaluate, and develop shale gas resources

## Course Objectives:

By the end of this course, participants will be able to:

1

Grasp the fundamental principles of unconventional resources and their role in the global energy landscape

2

Identify and characterize shale gas reservoirs and their unique geological characteristics

3

Apply reservoir engineering concepts to evaluate shale gas potential and well performance

4

Understand the principles of hydraulic fracturing and its role in stimulating shale gas production

5

Analyze the economic considerations and challenges associated with shale gas development

## Course Agenda:

### Day 1: Introduction to Unconventional Resources

- Delve into the significance of unconventional resources and their growing importance in the global energy mix
- Explore the history of unconventional resource development and the technological advancements that have led to their viability
- Discuss the classification of unconventional resources, including shale gas, tight gas, and coalbed methane
- Analyze the economic and environmental considerations associated with unconventional resource development

### Day 2: Shale Gas Geology and Reservoir Characterization

- Understand the geological formation and characteristics of shale gas reservoirs
- Discuss the properties of shale gas, including pore size, permeability, and organic content
- Explore the application of seismic, well logging, and core analysis techniques to characterize shale gas reservoirs
- Analyze the factors influencing shale gas reservoir quality and potential

### Day 3: Reservoir Engineering Concepts for Shale Gas

- Apply reservoir engineering principles to evaluate shale gas well performance and reserves estimation
- Understand the concept of Darcy's law and its application to shale gas flow
- Analyze the impact of reservoir properties, wellbore geometry, and stimulation techniques on shale gas production
- Discuss the importance of understanding multiphase flow and fluid dynamics in shale gas reservoirs

### Day 4: Hydraulic Fracturing Fundamentals and Applications

- Delve into the principles of hydraulic fracturing and its role in stimulating shale gas production
- Explore the components of a hydraulic fracturing treatment system, including fluids, proppants, and fracture geometry control techniques
- Discuss the design and optimization of hydraulic fracturing treatments based on reservoir characteristics and wellbore considerations

- Analyze the impact of hydraulic fracturing on shale gas reservoir permeability, well performance, and environmental considerations

#### Day 5: Shale Gas Economics and Challenges

- Understand the economic considerations associated with shale gas development, including drilling costs, stimulation expenses, and infrastructure investments
- Analyze the factors influencing shale gas production economics, such as reservoir quality, well performance, and market prices
- Discuss the challenges and opportunities associated with shale gas development, including environmental concerns, water resource management, and regulatory frameworks
- Explore case studies of successful shale gas projects and identify key lessons learned

#### Who Should Attend:

- Reservoir engineers and geoscientists involved in shale gas exploration, evaluation, and development
- Petroleum engineers responsible for well performance optimization, production forecasting, and unconventional resource management
- Drilling engineers and completions specialists focused on hydraulic fracturing design, wellbore integrity, and unconventional reservoir development
- Students and professionals interested in pursuing a career in unconventional oil and gas production, reservoir engineering, and shale gas evaluation

#### Course Benefits:

- Develop a comprehensive understanding of unconventional resources, shale gas geology, and reservoir engineering concepts
- Gain hands-on experience in evaluating shale gas potential, designing hydraulic fracturing treatments, and analyzing production data
- Enhance your ability to apply reservoir engineering and economic principles to shale gas development projects
- Stay updated on the latest advancements in shale gas exploration, stimulation technologies, and environmental management strategies
- Network with other engineers, geoscientists, and technical professionals in the field of unconventional resources and shale gas development