

**Course Name: Advanced Enhanced Oil Recovery Techniques: Field Applications**

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**Objectives:** This course focuses on the advanced techniques and field applications of enhanced oil recovery (EOR) methods in the oil and gas industry. Students will gain a deeper understanding of reservoir characterization, EOR selection criteria, and the practical implementation of various EOR techniques. The course will cover advanced topics such as chemical flooding, thermal methods, gas injection techniques, and their integration in real-world oil fields. Field case studies and industry best practices will be explored to provide students with practical insights into EOR field applications.

**Course Contents:**

**Introduction to Enhanced Oil Recovery (EOR):** Overview of EOR methods and their significance in the industry, Reservoir characteristics and challenges for EOR implementation

**Drilling Multilaterals for EOR:** Multilaterals Technology, Advance well planning for EOR Applications

**Chemical Flooding Techniques:** Principles and mechanisms of chemical flooding, Surfactant, polymer, and alkaline flooding methods, Selection criteria and optimization of chemical flooding processes

**Thermal Methods for Enhanced Oil Recovery:** Steam injection and cyclic steam stimulation (CSS), In-situ combustion and steam-assisted gravity drainage (SAGD), Design considerations and operational challenges for thermal EOR

**Gas Injection Techniques:** Gas flooding methods: CO<sub>2</sub> flooding and nitrogen flooding, Selection criteria and reservoir management for gas injection, Challenges and opportunities in gas EOR projects

**Integrated EOR Field Applications:** Combining multiple EOR techniques for maximum recovery, Field-scale implementation of EOR projects, Monitoring and surveillance of EOR processes

**Case Studies and Industry Best Practices:** Analysis of successful EOR field applications, Lessons learned and key takeaways from EOR projects, Emerging trends and technologies in EOR field applications.

**Reference Text books:**

"Enhanced Oil Recovery: Field Planning and Development Strategies" by Vladimir Alvarado and G. Paul Willhite

"Practical Enhanced Reservoir Engineering: Assisted with Simulation Software" by Abdus Satter and Ganesh Thakur

"Chemical Enhanced Oil Recovery (cEOR): A Practical Overview" by Laura Romero-Zerón and Eduardo Manrique-Espinoza