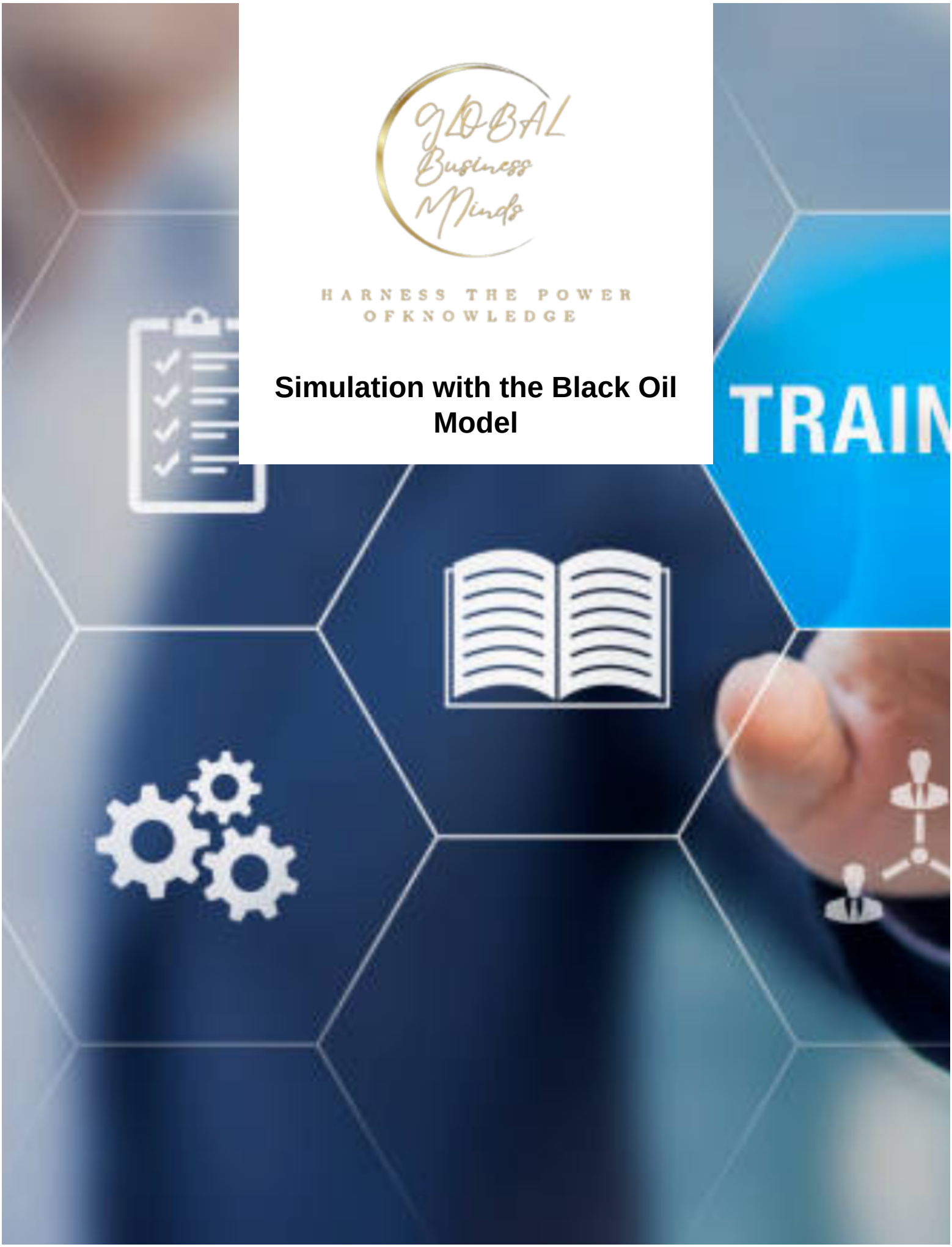
GLOBAL
Business
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HARNESS THE POWER
OF KNOWLEDGE
Simulation with the Black Oil
Model
TRAIN

Course Overview:
Reservoir simulation using the black oil model has become an essential tool for reservoir engineers and geoscientists to predict fluid flow behavior, optimize production strategies, and evaluate enhanced oil recovery (EOR) techniques
This comprehensive 5-day professional training course will equip engineers and geoscientists with the theoretical foundation and practical skills to effectively apply the black oil model for reservoir simulation

Course Objectives:
By the end of this course, participants will be able to:
1
Understand the fundamental principles and assumptions of the black oil model
2
Apply the black oil model to simulate fluid flow, pressure distribution, and saturation changes in reservoir systems
3
Utilize reservoir simulation software to create and run black oil models for various reservoir types and production scenarios
4
Interpret simulation results to assess reservoir performance, identify production problems, and optimize well placement and production strategies
5
Apply reservoir simulation to evaluate EOR techniques and predict their impact on reservoir performance
Course Agenda:
Day 1: Introduction to Reservoir Simulation and the Black Oil Model
• Delve into the significance of reservoir simulation in understanding fluid flow and optimizing reservoir performance
• Explore the fundamental principles of the black oil model, including its assumptions and limitations
• Discuss the representation of reservoir fluids, rock properties, and wellbore dynamics in the black oil model
• Understand the concept of gridblocks and discretized representation of the reservoir in reservoir simulation
Day 2: Black Oil Model Equations and Solution Techniques
• Derive the governing equations of the black oil model, including mass conservation, momentum conservation, and energy balance
• Discuss various numerical solution techniques used in reservoir simulation, such as finite difference methods and finite element methods
• Analyze the stability and convergence criteria for reservoir simulation models
• Apply solution techniques to solve the black oil model equations for a simple reservoir example
Day 3: Reservoir Simulation Software and Model Setup
• Introduce reservoir simulation software and its role in performing black oil model simulations
• Discuss the steps involved in setting up a black oil model, including defining the reservoir geometry, grid system, and initial conditions
• Learn about various input parameters and data requirements for black oil model simulations
• Practice setting up a simple black oil model using reservoir simulation software
Day 4: Black Oil Model Simulation and Result Interpretation
• Run black oil model simulations for various reservoir scenarios, including primary production, secondary recovery, and EOR techniques
• Analyze simulation results to understand fluid flow patterns, pressure distribution, saturation changes, and well performance
• Identify production problems and optimize well placement and production strategies based on simulation

results
• Discuss the importance of sensitivity analysis and uncertainty quantification in reservoir simulation
Day 5: Advanced Black Oil Model Applications and Future Trends
• Explore advanced applications of the black oil model, such as modeling dual-porosity and dual-permeability reservoirs
• Discuss the integration of black oil models with other modeling techniques, such as geomechanics and geochemistry
• Explore the future trends and advancements in black oil model development, reservoir simulation software, and real-time reservoir management
Who Should Attend:
• Reservoir engineers and geoscientists involved in reservoir simulation, production optimization, and EOR techniques
• Petroleum engineers responsible for well placement, well performance modeling, and field development planning
• Production engineers involved in reservoir management, well testing, and fluid flow analysis
• Students and professionals interested in pursuing a career in reservoir engineering, reservoir simulation, and subsurface analysis
Course Benefits:
• Develop a comprehensive understanding of the black oil model, its principles, and applications in reservoir simulation
• Gain hands-on experience in setting up, running, and interpreting black oil model simulations using reservoir simulation software
• Enhance your ability to analyze reservoir performance, identify production problems, and optimize production strategies
• Stay updated on the latest advancements in black oil model development, reservoir simulation software, and EOR applications
• Network with other engineers and geoscientists to foster collaboration and knowledge sharing in the field of reservoir simulation and production optimization