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COURSE BROCHURE

# Agent-Based Simulation for Field Production Training Course

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Doha

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Registered in the United Kingdom and Saudi Arabia

# Agent-Based Simulation for Field Production Training Course

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Agent-Based Simulation for Field Production is a 1-week training course for production engineers, reservoir engineers and field planners who must decide how wells, facilities, rigs and crews interact under real constraints, and it ends with an agent-based field optimisation model brief. Mature fields now juggle intervention backlogs, shared processing capacity and scarce crews, so spreadsheet averages hide the bottlenecks that cost output. Jupiter Prime Training runs this course for upstream planning teams.

## Why Agent-Based Simulation for Field Production Matters Now

Three pressures favour agent-based thinking in the field. Ageing wells need more workovers, chemical treatments and artificial lift changes than crews can deliver. Gathering networks and processing plants are often shared between fields, so one compressor trip ripples through many wells. Leadership wants evidence before spending on new rigs, vessels or debottlenecking. Teams that model these interactions find the true constraint and test schedules safely before committing crews. Teams that rely on static plans keep chasing the last failure and discover queueing delays only after production has been lost.

## Who Gains Most from Agent-Based Simulation for Field Production

- Production engineers responsible for well rates, artificial lift and intervention priorities
- Reservoir engineers responsible for decline forecasts and pressure maintenance plans
- Field planners responsible for rig, vessel and crew schedules across many sites
- Facilities engineers responsible for separator, compressor and pipeline capacity limits
- Data and digital specialists responsible for model inputs, calibration and dashboards

Asset teams that send a production engineer, a field planner and a data specialist together gain most.

## Agent-Based Simulation for Field Production Capabilities

The capabilities below turn wells, plants and crews into interacting agents whose behaviour can be tested before field decisions are made.

- Design agents for wells, facilities, rigs and crews with clear rules and states — model scoping
- Specify constraints for gathering capacity, crew skills and logistics windows — field planners
- Build scheduling logic that ranks interventions by deferred production — operations leadership
- Calibrate the model against historical rates, downtime and job durations — reservoir and production engineers
- Test scenarios such as added crews, new compression or changed priorities — investment decisions

- Communicate simulation results with uncertainty ranges and assumptions — asset management

## Key Agent-Based Simulation for Field Production Terms

- Agent — A model element such as a well, crew or compressor that follows its own rules and reacts to other elements.
- Agent-based simulation — A modelling method where system behaviour emerges from many interacting agents rather than from fixed equations.
- Deferred production — Output lost or delayed because a well is shut in, constrained or waiting for intervention.
- Discrete-event logic — Model steps triggered by events such as a failure, arrival or job completion.
- Calibration — Tuning model parameters until simulated results match recorded field history.
- Scenario experiment — A controlled set of simulation runs that compares options under the same assumptions.

## Agent-Based Simulation for Field Production Day by Day

### Day 1: Field Systems as Interacting Agents

- Field Value Chain Mapping — Wells, Networks, Plants and Export
- Static Plans Versus Dynamic Simulation — Hidden Bottleneck Detection
- Agent, Discrete-Event and System Dynamics Methods — Method Selection
- Deferred Production Accounting — Loss Categories and Baseline
- Model Purpose Statement — Decision Questions the Model Must Answer

### Day 2: Designing Well, Facility and Crew Agents

- Well Agents with Decline and Failure Behaviour — Rate Forecast Inputs
- Facility Agents for Separators, Compressors and Pipelines — Capacity Limits
- Crew, Rig and Vessel Agents — Skills, Travel and Availability
- Agent Rules and State Charts — Behaviour Under Upsets
- Data Requirements and Sources — Historian, Maintenance and Logistics Records

### Day 3: Constraints, Scheduling and Logistics

- Gathering and Processing Constraints — Allocation Between Wells
- Intervention Prioritisation Rules — Deferred Production Ranking
- Crew Rostering and Travel Logic — Field Coverage Gaps
- Spare Parts and Supply Delays — Repair Time Effects
- Weather and Access Windows — Offshore and Remote Site Scheduling

## Day 4: Calibration and Scenario Experiments

- History Matching Against Rates and Downtime — Model Credibility
- Sensitivity Testing of Key Parameters — Influence Ranking
- Monte Carlo Repetitions — Uncertainty Ranges in Results
- Scenario Design for Added Crews or Compression — Investment Comparison
- Results Visualisation for Leadership — Clear Decision Framing

## Day 5: Practising the Agent-Based Field Optimisation Model Brief

- Model Scope and Purpose — Applying Day 1 Mapping to a Case Field
- Agent Catalogue — Applying Day 2 Design Rules
- Constraint and Schedule Logic — Applying Day 3 Prioritisation
- Calibration and Scenario Plan — Applying Day 4 Experiments
- Agent-Based Field Optimisation Model Brief — Data, Build Plan and Owners

## Applying Agent-Based Simulation for Field Production After the Course

- Rebuild last quarter's deferred production by cause and identify which constraint a model should represent first.
- Draft agent rules for one well group and its crew, and test them against recorded intervention durations.

## Agent-Based Simulation for Field Production Questions FAQ

### What is agent-based simulation for field production and why does it matter now?

Agent-based simulation for field production models wells, facilities and crews as interacting elements to test schedules and investments. It matters now because ageing fields, shared plants and scarce crews create bottlenecks that static plans cannot reveal.

### Which roles gain most from agent-based simulation for field production training?

Production engineers, reservoir engineers and field planners gain most, together with facilities engineers and data specialists who supply and maintain model inputs.

### How does agent-based simulation for field production differ from reservoir simulation training?

Agent-based simulation for field production models operations, logistics and surface constraints. Reservoir simulation training models fluid flow in rock to forecast recovery and is not designed to test crew schedules or intervention rules.

## What do you bring back from agent-based simulation for field production training?

You bring back a model brief that defines purpose, agents, constraints, calibration data and scenarios for one field, ready to start a build.

## Agent-Based Simulation for Field Production: The Way Forward

The agent-based field optimisation model brief first informs whether a simulation build is funded and which constraint it targets first. Production, reservoir and planning teams use it to agree data owners and scenarios. After the first calibrated runs, revisit the agent rules against field results before using the model for investment cases.