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COURSE BROCHURE

Advanced AI and Big Data for Logistics Route Optimisation Training

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Registered in the United Kingdom and Saudi Arabia

Advanced AI and Big Data for Logistics Route Optimisation Training

Advanced AI and Big Data for Logistics Route Optimisation is a 2-week training course for logistics analysts, transport planners and operations managers who build a fleet and network optimisation blueprint covering depot locations, vehicle routing rules and telematics data pipelines. Fuel, driver and delivery-window pressures now make every kilometre and every idle hour visible on the profit line. The course is delivered by Jupiter Prime Training.

Why AI and Big Data for Logistics Route Optimisation Matter Now

Three forces shape transport optimisation today. Customers and retailers impose tighter delivery windows and expect live arrival estimates; vehicles, trailers and handheld devices stream GPS, engine and proof-of-delivery records faster than dispatch teams can read them; and fuel and emissions scrutiny pushes fleet owners to justify every empty mile. Operators that combine telematics streams with mathematical optimisation cut distance, overtime and missed slots, while those relying on static zones and driver memory pay for detours daily. The course follows the Cross-Industry Standard Process for Data Mining CRISP-DM to move each routing question from framing to deployed model.

Who Gains Most from AI and Big Data for Logistics Route Optimisation

- Transport planners accountable for daily route plans, loads and driver shifts
- Network analysts who evaluate depot, hub and cross-dock locations
- Fleet specialists who manage vehicle utilisation, fuel and maintenance windows
- Telematics and data engineers who integrate GPS, engine and delivery events
- Distribution leads who negotiate service windows with retail and industrial customers

A transport control centre or distribution network team gains most when several members attend together and agree one set of routing objectives, constraints and data feeds.

AI and Big Data for Logistics Route Optimisation Capabilities

Participants move from drawing routes by hand to formulating, solving and monitoring optimisation models that react to traffic, capacity and customer windows.

- Specify vehicle routing models with time windows, capacities and driver rules — dispatch leads releasing daily plans
- Design depot and hub networks using facility location models — directors approving property and lease decisions
- Build travel-time and arrival prediction models from telematics records — customer service teams promising slots
- Assess fleet mix, load consolidation and backhaul options — finance partners reviewing cost per drop
- Test streaming pipelines for GPS and engine events — IT owners of the logistics data platform

- Communicate emissions and distance trade-offs with scenario dashboards — sustainability and commercial leaders

Key AI and Big Data for Logistics Route Optimisation Terms

- Vehicle routing problem with time windows — an optimisation model assigning stops to vehicles so each customer is served within its permitted delivery slot.
- Facility location model — a mathematical model choosing depot or hub sites that minimise transport and fixed costs for a given demand pattern.
- Telematics — the collection and transmission of vehicle location, speed, engine and driver data from onboard devices.
- Metaheuristic — a search strategy, such as tabu search or genetic algorithms, that finds good routing solutions when exact methods are too slow.
- Geofence — a virtual boundary around a site that triggers an event when a tracked vehicle enters or leaves it.
- Map matching — aligning noisy GPS points to the road network to reconstruct the route a vehicle actually drove.

AI and Big Data for Logistics Route Optimisation Day by Day

Day 1: Transport Economics and Optimisation Opportunity

- Cost-per-Drop and Cost-per-Kilometre Models — Locating Where Transport Money Leaks
- Delivery Window and Service Pattern Mapping — Capturing Customer Constraints
- Routing Opportunity Screening — Separating Strategic, Tactical and Daily Decisions
- CRISP-DM Business Understanding — Framing Routing Questions as Model Objectives
- Fleet Performance Baseline — Measuring Utilisation, Empty Miles and Overtime

Day 2: Telematics and Geospatial Big Data

- GPS, CAN-Bus and Proof-of-Delivery Feeds — Locating Movement and Engine Events
- Map Matching and Trip Reconstruction — Turning Raw Points Into Driven Routes
- Geofencing and Stop Detection — Measuring Dwell Times at Sites
- Geospatial Data Stores and Indexing — Querying Millions of Location Records
- Streaming Pipelines With Event Brokers — Feeding Live Dispatch Screens

Day 3: Travel-Time and Arrival Prediction

- Historical Speed Profiles by Road Segment — Estimating Realistic Leg Durations
- Gradient Boosting Arrival Models — Predicting Delays From Traffic and Weather
- Service-Time Prediction at Stops — Accounting for Unloading and Access Delays
- Delivery Volume Forecasts as Routing Inputs — Sizing Daily Workloads
- Prediction Interval Reporting — Giving Customers Honest Arrival Windows

Day 4: Vehicle Routing Formulations

- Capacitated Vehicle Routing Model — Respecting Weight, Volume and Pallet Limits
- Time-Window and Driver-Hours Constraints — Building Legal, Feasible Routes
- Pickup and Delivery With Backhauls — Filling Return Legs Profitably
- Multi-Depot and Heterogeneous Fleet Variants — Mixing Vans, Rigids and Articulated Trucks
- Objective Weighting — Balancing Distance, Overtime and Service Penalties

Day 5: Solvers and Metaheuristics

- Mixed-Integer Programming Solvers — Solving Exact Models for Smaller Networks
- Tabu Search and Large Neighbourhood Search — Scaling to Thousands of Stops
- Genetic Algorithms for Route Design — Exploring Alternative Territory Shapes
- Open-Source Routing Libraries — Prototyping With OR-Tools and Similar Packages
- Solution Quality Benchmarking — Comparing Optimality Gaps and Run Times

Day 6: Network Design and Facility Location

- Facility Location and Hub Models — Choosing Depot Count and Placement
- Cross-Dock and Consolidation Flows — Reducing Part-Load Movements
- Territory and Zone Design — Balancing Workload Across Drivers
- Scenario Analysis for Network Change — Testing Openings, Closures and Mergers
- Green Routing and Emissions Accounting — Weighing Distance Against Carbon

Day 7: Dynamic and Real-Time Routing

- Dynamic Re-Optimisation Triggers — Reacting to Breakdowns, Traffic and New Orders
- Reinforcement Learning for Dispatch — Assigning Jobs as They Arrive
- Same-Day and On-Demand Delivery Models — Batching Orders Into Waves
- Exception Alerting From Telematics — Flagging Late Vehicles Before Customers Call
- Control Room Dashboards — Showing Live Routes, Risks and Interventions

Day 8: Fleet Mix, Assets and Drivers

- Fleet Sizing and Mix Optimisation — Choosing Own Versus Subcontracted Capacity
- Electric Vehicle Range and Charging Constraints — Routing Battery Fleets
- Predictive Maintenance From Engine Data — Scheduling Workshop Slots Around Routes
- Driver Behaviour Scoring — Linking Harsh Events to Fuel and Safety
- Load Building and Container Packing — Raising Trailer Fill Rates

Day 9: Deploying and Measuring Routing Models

- MLOps for Travel-Time Models — Retraining as Roads and Patterns Change
- Planner-in-the-Loop Overrides — Capturing Local Knowledge Without Losing Gains
- Route Plan Versus Actual Analysis — Measuring Adherence and Deviations
- Benefit Tracking — Linking Kilometres, Hours and Slots to Cost
- Integration With Transport Management Systems — Releasing Plans to Drivers

Day 10: Practising the Fleet and Network Optimisation Blueprint

- Grocery Home Delivery Case — Applying Time-Window Routing and Arrival Prediction
- Building Materials Distribution Case — Applying Heterogeneous Fleet and Backhaul Models
- Parcel Network Case — Applying Facility Location and Zone Design
- Operations Board Challenge — Defending Objectives, Constraints and Data Needs
- Fleet and Network Optimisation Blueprint — Completing Models, Data Feeds and Benefit Measures

Applying AI and Big Data for Logistics Route Optimisation After the Course

- Reconstruct one week of driven routes from telematics data and compare them with planned routes to quantify avoidable kilometres.
- Prototype a time-window routing model for one depot with an open-source solver and benchmark it against current plans.

AI and Big Data for Logistics Route Optimisation Questions FAQ

What is advanced AI and big data for logistics route optimisation, and why does it matter now?

It is the use of telematics data, machine learning and mathematical optimisation to plan routes, size fleets and design depot networks. It matters now because delivery windows are tighter and fuel, labour and emissions costs make every wasted kilometre visible.

Which roles gain most from AI and big data for logistics route optimisation training?

Transport planners, network analysts, fleet specialists and telematics engineers gain most. You benefit if you plan daily routes, evaluate depots or manage fleets for retail, building materials, parcels or industrial distribution.

How does an AI and big data for logistics route optimisation course differ from a general supply chain AI course?

It concentrates on transport networks, vehicle routing and telematics data rather than demand forecasting and stock planning. A general supply chain AI course surveys many applications, while this subject builds and solves routing and network models in depth.

What do you bring back from AI and big data for logistics route optimisation training?

You bring back a documented design covering routing formulations, network scenarios, telematics data feeds and benefit measures, ready for a pilot at one depot or region.

AI and Big Data for Logistics Route Optimisation: The Way Forward

The fleet and network optimisation blueprint first informs which depot or route family moves to model-based planning. Transport planners, fleet owners and data engineers use it to agree objectives, constraints and data feeds. After the first pilot, revisit the travel-time models and objective weights, because driven routes and customer feedback reveal which constraints were understated.