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COURSE BROCHURE

Smart Energy Digitalisation and AI Training Course

7 – 11 March 2027
Muscat

jupiterprime.uk

info@jupiterprime.uk

Registered in the United Kingdom and Saudi Arabia

Smart Energy Digitalisation and AI Training Course

Ref: 1564_57529 **Date:** 7 – 11 March 2027 **Location:** Muscat **Fees:** 6500 GBP

Smart Energy Digitalisation and AI is a 1-week training course for energy managers, utility engineers and digital transformation leads who must modernise grids, plants and networks and set out an energy digitalisation roadmap for their operation. Rising renewable shares, two-way power flows and ageing transformers now demand faster forecasting and condition-based intervention than manual methods allow. Jupiter Prime Training delivers this course for leaders steering generation, transmission and distribution assets into a data-driven era.

Why Smart Energy Digitalisation and AI Matters Now

Three forces reshape energy operations: variable solar and wind output that complicates balancing, consumers with rooftop panels, batteries and electric vehicles who both draw and export power, and asset fleets approaching end of design life. Operators that digitalise well forecast load precisely, defer capital spending through condition-based maintenance and cut outage minutes; those that delay face curtailment, emergency repairs and frustrated customers. Where AI forecasts and asset scores drive dispatch or repair, the course applies ISO/IEC 42001, the AI management system standard, and the NIST AI Risk Management Framework NIST AI RMF to keep models accountable.

Who Gains Most from Smart Energy Digitalisation and AI

- Energy and plant managers who balance generation, storage and demand across sites
- Transmission and distribution engineers who plan network reinforcement and outage response
- Asset managers who decide inspection intervals, refurbishment and replacement
- Digital transformation leads who run SCADA, metering and analytics programmes of change
- Commercial and trading staff who rely on load and price forecasts

Utilities and large energy users gain most when operations, asset and digital leads attend together, because a roadmap only works when control-room needs, field realities and data platforms are planned as one.

Smart Energy Digitalisation and AI Capabilities

Participants leave able to connect grid physics, asset condition and data architecture in one investment sequence.

- Assess grid digitalisation maturity across SCADA, metering and field devices — executive investment boards
- Build short-term load and renewable output forecasts with machine learning — dispatch and trading desks
- Apply asset health indices and failure prediction to transformers and turbines — maintenance planners
- Design an energy data platform with historian, metering and GIS integration — IT and OT architects
- Weigh demand response, storage and network reinforcement options — planning engineers
- Communicate a phased digitalisation roadmap with benefits and cyber controls — boards and regulators' liaison staff

Key Smart Energy Digitalisation and AI Terms

- Smart grid — an electricity network using sensors, communications and automation to balance supply and demand and isolate faults quickly.
- Advanced metering infrastructure — smart meters and communications that record consumption at short intervals and support remote reading and control.
- Asset health index — a score combining condition data, age and loading to rank equipment by likelihood of failure.
- Demand response — programmes that shift or reduce customer consumption at peak times in exchange for incentives.
- Distributed energy resources — small generation and storage units such as rooftop solar and batteries connected near consumers.
- Digital twin — a live software model of a plant or network fed by sensor data to test scenarios before acting.

Smart Energy Digitalisation and AI Day by Day

Day 1: The Changing Energy System

- Renewable Intermittency and Balancing — Why Forecast Accuracy Now Matters
- Prosumers, Batteries and Electric Vehicles — Two-Way Power Flows
- Ageing Asset Fleets — Replacement Pressure and Capital Constraints
- Digitalisation Maturity Assessment — SCADA, Metering and Field Devices
- Sector Comparisons — Power Utilities and Industrial Energy Users

Day 2: Smart Grids and Metering

- Advanced Metering Infrastructure — Interval Data and Remote Operations
- Distribution Automation and Fault Isolation — Shortening Outage Minutes
- Demand Response Programmes — Shaving Peaks Without New Plant
- Distributed Energy Resource Management — Hosting Capacity Decisions
- OT Cyber Security Controls — Protecting Substations and Control Rooms

Day 3: AI Forecasting for Load and Renewables

- Load Forecasting with Gradient Boosting — Weather, Calendar and Tariff Drivers
- Solar and Wind Output Prediction — Nowcasting for Dispatch
- Price and Imbalance Forecasts — Supporting Trading Decisions
- Forecast Error Metrics — MAPE, Bias and Peak Accuracy
- NIST AI RMF Checks for Forecast Models — Drift and Accountability

Day 4: Predictive Asset Care and Data Platforms

- Asset Health Indices — Transformers, Cables and Rotating Plant
- Dissolved Gas and Vibration Analytics — Early Failure Signatures
- Digital Twins of Plants and Feeders — Testing Interventions Virtually
- Energy Data Platform Design — Historians, GIS and Meter Data Integration
- IT and OT Convergence — Ownership and Interface Rules

Day 5: Practising the Energy Digitalisation Roadmap

- Maturity Baseline for the Case Operation — Applying Day 1 Assessment
- Grid and Metering Priorities — Applying Day 2 Options
- Forecasting and Asset Analytics Use Cases — Applying Days 3 and 4
- Benefits Case and Phasing — Capital Deferral, Outage and Fuel Savings
- Energy Digitalisation Roadmap — Final Phased Plan for Board Approval

Applying Smart Energy Digitalisation and AI After the Course

- Benchmark the current day-ahead load forecast against a gradient boosting model using one year of meter and weather data.
- Calculate asset health indices for the transformer fleet and propose a revised inspection and refurbishment sequence.

Smart Energy Digitalisation and AI Questions FAQ

What is smart energy digitalisation and AI, and why does it matter now?

It is the use of sensors, data platforms and AI models to run grids and plants more precisely. It matters now because variable renewables, two-way power flows and ageing assets make manual forecasting and time-based maintenance too slow and costly.

Which roles gain most from smart energy digitalisation and AI?

Energy and plant managers, network engineers, asset managers, digital transformation leads and trading staff gain most. Each depends on forecasts, asset scores or platform data, so a shared roadmap aligns investments across control room and field.

How does smart energy digitalisation and AI differ from an electrical engineering AI and IoT course?

It takes a management view across the whole energy operation. You prioritise grid, forecasting, asset and platform investments in a roadmap, while an engineering course concentrates on device-level sensing, protection settings and circuit design.

What do you bring back from smart energy digitalisation and AI training?

You bring back a phased roadmap for a real operation, covering maturity baseline, priority use cases, platform design and a benefits case. It gives your board a clear sequence for digital investment.

Smart Energy Digitalisation and AI: The Way Forward

The energy digitalisation roadmap first informs which digital investments enter next year's capital plan. Energy managers use it to sequence projects, asset managers to shift towards condition-based work, and digital leads to scope platforms. After the first forecasting and asset analytics releases, revisit the benefits case, since measured error reductions and deferred replacements often reorder later phases.