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COURSE BROCHURE

Load Forecasting and Network Capacity Planning Training Course

23 – 27 May 2027
Muscat

jupiterprime.uk

info@jupiterprime.uk

Registered in the United Kingdom and Saudi Arabia

Load Forecasting and Network Capacity Planning Training Course

Ref: 2619_99629 **Date:** 23 – 27 May 2027 **Location:** Muscat **Fees:** 6500 GBP

Load Forecasting and Network Capacity Planning is a 1-week training course for distribution and transmission planning engineers who turn demand projections into reinforcement decisions, and each participant leaves with a network capacity upgrade plan. Electrification of transport and heating, new industrial connections and rooftop generation are reshaping when and where feeders and substations reach their limits. Jupiter Prime Training delivers this course on Load Forecasting and Network Capacity Planning.

Why Load Forecasting and Network Capacity Planning Matters Now

Three forces now press on network planners at once. Customers electrify vehicles, heating and cooling faster than historic growth curves predicted. Large connection applicants, from data centres to desalination and manufacturing sites, request capacity on short notice. Embedded solar and storage alter the shape of the daily demand curve and hide true load behind the meter. A utility that forecasts well reinforces the right circuit at the right time; one that forecasts badly strands capital or rations connections. The course rests on established planning practice: weather-corrected peak estimation, scenario-based growth and probabilistic security assessment.

Who Gains Most from Load Forecasting and Network Capacity Planning

- Engineers who prepare annual peak and energy demand forecasts for distribution areas
- Engineers who assess firm capacity and loading at primary and bulk supply substations
- Engineers who evaluate large connection applications and their reinforcement triggers
- Engineers who build long-term transmission expansion cases and load flow models
- Engineers who compile capital reinforcement submissions for investment committees

A planning group that sends forecasters and reinforcement designers together gains most, because both sides learn to share one set of demand assumptions.

Load Forecasting and Network Capacity Planning Capabilities

The outcomes link a demand estimate on a spreadsheet to a firm reinforcement choice on a single-line diagram.

- Calculate weather-corrected peak demand from metered substation data — firm capacity reviews
- Build spatial demand scenarios from connection pipelines and electrification uptake — long-term expansion cases
- Assess headroom against firm capacity under outage conditions — security of supply decisions
- Weigh reinforcement against flexibility and demand response options — capital allocation committees
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Test the timing of upgrades against forecast uncertainty bands — deferral and phasing choices
- Communicate capacity constraints and upgrade timelines to connection customers — commercial and customer teams

Key Load Forecasting and Network Capacity Planning Terms

- Coincident peak — the highest combined demand of a group of loads at the same moment, lower than the sum of individual peaks.
- Firm capacity — the load a substation can supply with its largest transformer or circuit out of service.
- Diversity factor — the ratio of the sum of individual maximum demands to the coincident maximum demand of the group.
- Weather correction — adjustment of measured peak demand to a standard temperature condition so years can be compared fairly.
- Spatial load forecast — a projection of demand growth by geographic area, feeder or substation rather than system total.
- Reinforcement trigger — the forecast loading level at which an upgrade must be committed to keep supply secure.

Load Forecasting and Network Capacity Planning Day by Day

Day 1: Demand Drivers and Load Behaviour

- Daily And Seasonal Load Profiles — Shape Of The Planning Peak
- Customer Class Composition — Residential, Commercial And Industrial Growth Signals
- Electrification Of Transport And Heating — New Evening Peak Patterns
- Behind-The-Meter Solar And Storage — Masked Demand And Reverse Flow
- Metering And Supervisory Data Quality — Trustworthy Historic Loading Records

Day 2: Forecasting Methods and Uncertainty

- Trend And Regression Models — Baseline Energy And Peak Projection
- Temperature Sensitivity Analysis — Weather-Corrected Peak Estimates
- Spatial Forecasting By Feeder And Substation — Local Growth Allocation
- Probabilistic Forecast Bands — Planning For High And Low Outcomes
- Forecast Back-Testing And Error Tracking — Confidence In Method Choice

Day 3: Connections, Scenarios and Network Loading

- Large Connection Pipeline Screening — Probability-Weighted Committed Load
- Growth Scenario Construction — Electrification, Industry And Embedded Generation Cases
- Load Flow Studies On Forecast Years — Thermal And Voltage Limit Breaches
- Firm Capacity And Outage Contingency Checks — Security Of Supply Standards
- Headroom Mapping Across Substations — Where Constraints Appear First

Day 4: Reinforcement Options and Investment Timing

- Transformer Uprating And New Substation Options — Capacity Added Per Unit Cost
- Feeder Reconfiguration And Load Transfers — Low-Cost Deferral Choices
- Flexibility Contracts And Demand Response — Alternatives To New Assets
- Least-Regret Upgrade Sequencing — Timing Under Forecast Uncertainty
- Lifecycle Cost Comparison Of Options — Capital Committee Recommendation

Day 5: Practising the Network Capacity Upgrade Plan

- Area Forecast Assembly From Earlier Methods — Agreed Planning Basis
- Constraint Register From Load Flow Results — Prioritised Problem List
- Option Appraisal Matrix Applied To Constraints — Preferred Solution Per Site
- Stakeholder Briefing On Capacity Limits — Customer And Executive Messages
- Network Capacity Upgrade Plan Completion — Phased Reinforcement Schedule

Applying Load Forecasting and Network Capacity Planning After the Course

- Re-run the weather-corrected peak for one supply area and compare it with the forecast currently used for reinforcement triggers.
- Build a probability-weighted connection pipeline for the most constrained substation and test whether its planned upgrade date still holds.

Load Forecasting and Network Capacity Planning Questions FAQ

What is Load Forecasting and Network Capacity Planning and why does it matter now?

It is the discipline of projecting electricity demand by area and deciding when networks need reinforcing. It matters now because electrification, large new connections and rooftop generation change demand faster than historic trends, so planners need methods that handle uncertainty.

Which roles gain most from Load Forecasting and Network Capacity Planning?

Distribution and transmission planning engineers gain most. That includes those who prepare demand forecasts, assess substation firm capacity, screen connection applications and compile reinforcement cases for investment approval.

How does Load Forecasting and Network Capacity Planning differ from a power system protection course?

This course looks years ahead at demand and capacity, not at fault clearance. A protection course studies relays, settings and fault behaviour, whereas you here work with forecasts, load flow on future years and reinforcement timing.

What do you bring back from Load Forecasting and Network Capacity Planning?

You bring back a phased upgrade plan for a supply area. It combines a weather-corrected forecast, growth scenarios, a constraint register and an option appraisal that your planning group can adopt and refine.

Load Forecasting and Network Capacity Planning: The Way Forward

The network capacity upgrade plan first informs which substation or feeder reinforcement to commit in the next capital cycle. Planning engineers, asset investment managers and connection teams all draw on it. After its first use, revisit the forecast uncertainty bands against actual peak readings, since electrification and embedded generation can shift the timing of every later reinforcement trigger.