CORE CONCEPT

Industrial AI Course for Manufacturing and Energy: Use Cases, Data Readiness and Scaling Pilots

17 – 21 October 2027
Riyadh - KAFD district five-star

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Ref: 2162_30946 **Date:** 17 – 21 October 2027 **Location:** Riyadh - KAFD district five-star **Fees:** 21450 SAR

Introduction:

Industrial AI for manufacturing and energy, covering use cases, data readiness and scaling pilots, is a 1-week course for engineering, operations, digital transformation and data leads in manufacturing plants, oil and gas, power and utility organisations, ending with an Industrial AI Use-Case Portfolio and Pilot-to-Scale Roadmap. Many organisations run AI pilots that never leave the proof-of-concept stage because the use case had no clear value, the plant data was not ready or nobody owned the model in operation. Nominees already lead improvement, engineering or data work, and teaching is by case study on plant and grid data. CoreConcept Training Center delivers this industrial AI course.

Course Objectives:

- Identify and prioritise industrial AI use cases with a value case covering throughput, quality, energy, safety and maintenance benefits
- Assess data readiness of historians, OT systems and maintenance records and plan data quality fixes
- Select machine learning, computer vision and generative AI approaches that fit each use case and data set
- Specify pilots with success criteria, baselines and operator involvement so that results can be trusted
- Plan model deployment, monitoring and retraining at the edge and in the cloud through MLOps practices
- Apply ISO/IEC 42001 and the NIST AI Risk Management Framework to govern industrial AI risks and responsibilities

Target Audience:

- Engineering managers responsible for process, reliability and quality improvement
- Operations managers responsible for plant, field or grid performance
- Digital transformation leads responsible for AI and analytics portfolios
- Data and analytics leads responsible for industrial data platforms and models
- Energy and sustainability managers responsible for consumption and emissions reduction

Course Outline:

Day 1: Industrial AI Landscape and Value Cases

- Industrial AI Use-Case Families Across Plants and Grids
- Value Case Method for Throughput, Quality and Energy
- Use-Case Prioritisation Matrix by Value and Feasibility
- Lessons From Stalled AI Pilots in Industry
- Current AI Maturity and Opportunity Baseline Review

Day 2: Industrial Data Foundations and AI Methods

- Process Historian and OT Data Access Patterns
- Data Quality Assessment for Sensor and Maintenance Records
- Supervised Learning Models for Soft Sensors and Prediction
- Computer Vision Approaches for Visual Inspection Tasks
- Generative AI Assistants for Procedures and Maintenance Knowledge

Day 3: Applying AI to Operations, Quality and Energy

- Process Optimisation Models for Yield and Throughput
- Quality Prediction Using Upstream Process Variables
- Demand and Load Forecasting for Plants and Utilities
- Energy Consumption Optimisation With Machine Learning Models
- Pilot Design With Baselines, KPIs and Operator Feedback

Day 4: Scaling, Governance and Problem Cases

- MLOps Pipelines for Edge and Cloud Model Deployment
- Model Drift Monitoring and Retraining Triggers in Production
- ISO/IEC 42001 AI Management System Responsibilities
- NIST AI Risk Management Framework Govern, Map, Measure, Manage
- Failed Scale-Up Cases and Change Management Remedies

Day 5: Case Study Work and the Pilot-to-Scale Roadmap

- Refinery Case Study on Soft Sensor Value
- Manufacturing Line Case Study on Visual Inspection
- Utility Case Study on Load Forecasting Accuracy
- Use-Case Portfolio Scoring and Peer Challenge
- Industrial AI Pilot-to-Scale Roadmap Completion

Skills You Will Gain:

- AI Use-Case Prioritisation
- Value Case Development
- Industrial Data Readiness Assessment
- Machine Learning Method Selection
- AI Pilot Design
- MLOps Planning
- AI Risk Governance
- AI Scale-Up Planning

Why Attend This Course:

- Deliver an Industrial AI Use-Case Portfolio and Pilot-to-Scale Roadmap to the operations director and the digital transformation committee
- Decide which AI use cases to fund, which to pilot first and which to stop
- Avoid pilots that stall, models that drift unnoticed and AI decisions that no one owns
- Share the value case template, prioritisation matrix and pilot checklist with engineering and data colleagues

Conclusion:

Back at work, the participant gives the Industrial AI Use-Case Portfolio and Pilot-to-Scale Roadmap to the operations director, the digital transformation committee and the data team. They use it to approve the first pilots, assign model owners and plan the data fixes each pilot needs. After the first pilot review, the organisation should compare results with the baselines in the portfolio, record what blocked scaling and update the roadmap and governance controls accordingly.

Frequently Asked Questions FAQ:

What should participants know before an industrial AI course for manufacturing and energy?

Participants should understand their own operations and basic data concepts such as trends, variables and KPIs. Programming skills are not required. Bringing a list of improvement ideas or a sample data extract helps them build the portfolio around their organisation.

How does an industrial AI course for manufacturing and energy differ from a data science programming course?

Programming courses teach how to code and train models. This course teaches how to choose, justify, pilot, govern and scale AI use cases in plants and energy assets, working with data teams rather than replacing them.

Why do industrial AI pilots in manufacturing and energy often fail to scale?

Pilots often lack a clear value case, rely on data that is not ready for production and have no owner once the model goes live. Planning baselines, data fixes, MLOps and governance from the start makes scaling far more likely.

What do participants take back from the industrial AI course for manufacturing and energy?

Participants take back an Industrial AI Use-Case Portfolio with scored value cases and a Pilot-to-Scale Roadmap covering data readiness, pilot design, deployment and governance steps for their organisation.