Energy Analytics, AI and Production Decisions

GExperts Learning Academy | PC-X09 | PC | 12-18 weeks

Course overview

12-18 weeks PC programme focused on Energy Analytics, AI and Production Decisions, using energy-sector cases and applied decisions.

Designed for: Experienced professionals

Learning outcomes

- Explain core principles and terminology for Energy Analytics, AI and Production Decisions.
- Interpret an applied case using evidence and stated assumptions.
- Identify risks, safeguards, role boundaries and escalation points.
- Prepare a clear recommendation for a multidisciplinary audience.

Course guide

Work through each module objective, lesson and teaching note, complete the applied activity and assessment, then use the separate Academy practice page for practice questions and answer feedback.

Separate practice questions:
https://www.globalexpertsconsultoria.com/training/academy/courses/questions/?course=PC-X09

Academic and certification status

Draft learning resource for study and review. It does not confer accreditation, external certification, a regulated qualification, professional licence, safety-critical competence or site authorisation. Confirm approvals, current laws, standards, approved procedures and awarding-body requirements before delivery.

Module 1: Industrial data architecture and governance

Learning objectives

- Explain industrial data architecture and governance, interpret a case, select appropriate controls and justify a documented decision.

Lessons

1. Purpose and key terms of Industrial data architecture and governance
2. Systems and operating context
3. Evidence, assumptions and decision gates
4. Hazards, safeguards and escalation
5. Applied case: Energy Analytics, AI and Production Decisions

Detailed teaching notes

Teaching notes

Core explanation. Industrial data flows from sensors through historians and integration platforms to analysis and decisions. Define asset identity, units, timestamps, quality status and ownership. A large dataset is not necessarily fit for purpose.

Decision logic. Check time synchronisation, missing values, calibration changes and access permissions before analysis. Keep provenance and revision history. Avoid transferring confidential operational data into exercises; all datasets in this package are fictional.

Worked example. A trend combines pressure in bar and kilopascals under one label, producing a false step change.

Facilitator prompts. Ask learners to distinguish verified facts from assumptions, identify who has decision authority, name stop-work triggers and state what evidence could change their recommendation. Compare technical, HSE, commercial and community perspectives.

Activity. Create a data dictionary and quality checks for a fictional dataset.

Model answer guide. Define units, time basis, validity flags, owner and transformations; resolve inconsistent units before interpretation.

Assessment evidence. Score accuracy (30%), use of evidence (20%), safeguards (20%), analysis (20%) and communication (10%).

Applied activity

Create a data dictionary and quality checks for a fictional dataset.

Assessment

Formative: 10-question practice quiz with answer feedback

Summative: Applied decision brief or practical case assessed against the rubric; proposed pass mark 70%, subject to academic approval.

Practice

Use the separate Academy practice questions and answer key page for this module.

Module 2: Production forecasting

Learning objectives

- Explain production forecasting, interpret a case, select appropriate controls and justify a documented decision.

Lessons

1. Purpose and key terms of Production forecasting
2. Systems and operating context
3. Evidence, assumptions and decision gates
4. Hazards, safeguards and escalation
5. Applied case: Energy Analytics, AI and Production Decisions

Detailed teaching notes

Teaching notes

Core explanation. Forecasts combine reservoir behaviour, well availability, ramp-up, capacity constraints and downtime. Distinguish potential reservoir production from saleable output. State units, time basis and whether rates are instantaneous, daily averages or annual totals.

Decision logic. Build low, base and high cases with internally consistent constraints. Bottlenecks can shift as water production rises. Compare forecast to observed history when available and track revisions with reasons. Do not assign actual Namibian first-oil dates from classroom scenarios.

Worked example. A system with 100,000 barrels/day potential and 90% availability yields 90,000 barrels/day average before other constraints.

Facilitator prompts. Ask learners to distinguish verified facts from assumptions, identify who has decision authority, name stop-work triggers and state what evidence could change their recommendation. Compare technical, HSE, commercial and community perspectives.

Activity. Prepare a one-year forecast with availability falling to 80% for three months.

Model answer guide. Calculate period-weighted output and explain facility versus reservoir constraints separately.

Assessment evidence. Score accuracy (30%), use of evidence (20%), safeguards (20%), analysis (20%) and communication (10%).

Applied activity

Prepare a one-year forecast with availability falling to 80% for three months.

Assessment

Formative: 10-question practice quiz with answer feedback

Summative: Applied decision brief or practical case assessed against the rubric; proposed pass mark 70%, subject to academic approval.

Practice

Use the separate Academy practice questions and answer key page for this module.

Module 3: Artificial intelligence in operations

Learning objectives

- Explain artificial intelligence in operations, interpret a case, select appropriate controls and justify a documented decision.

Lessons

1. Purpose and key terms of Artificial intelligence in operations
2. Systems and operating context
3. Evidence, assumptions and decision gates
4. Hazards, safeguards and escalation
5. Applied case: Energy Analytics, AI and Production Decisions

Detailed teaching notes

Teaching notes

Core explanation. AI can support classification, anomaly detection and forecasting when data and evaluation match the intended task. Explain training data, validation, error and drift. A confident output is not evidence of correctness.

Decision logic. Use a decision-impact assessment and compare against a simpler baseline. Keep humans accountable for consequential choices. Avoid sensitive data in prompts and do not connect models to live controls through this course. Define fallback when data shift.

Worked example. A model trained on one pump type gives frequent false alarms on a different design.

Facilitator prompts. Ask learners to distinguish verified facts from assumptions, identify who has decision authority, name stop-work triggers and state what evidence could change their recommendation. Compare technical, HSE, commercial and community perspectives.

Activity. Create an evaluation plan with error costs and a human review route.

Model answer guide. Include representative test data, false positives and negatives, drift monitoring and clear limits.

Assessment evidence. Score accuracy (30%), use of evidence (20%), safeguards (20%), analysis (20%) and communication (10%).

Applied activity

Create an evaluation plan with error costs and a human review route.

Assessment

Formative: 10-question practice quiz with answer feedback

Summative: Applied decision brief or practical case assessed against the rubric; proposed pass mark 70%, subject to academic approval.

Practice

Use the separate Academy practice questions and answer key page for this module.

Module 4: Energy Analytics, AI and Production Decisions: Evidence and Deci

Learning objectives

- Explain energy analytics, ai and production decisions: evidence and decision gates, interpret a case, select appropriate controls and justify a documented decision.

Lessons

1. Purpose and key terms of Energy Analytics, AI and Production Decisions: Evidence and Decision Gates
2. Systems and operating context
3. Evidence, assumptions and decision gates
4. Hazards, safeguards and escalation
5. Applied case: Energy Analytics, AI and Production Decisions

Detailed teaching notes

Teaching notes

Core explanation. Energy Analytics, AI and Production Decisions: Evidence and Decision Gates describes a practical part of Energy Analytics, AI and Production Decisions. Learners connect the principles to asset performance, people, operational risk, project value and local context.

Decision logic. Review the objective, evidence, limits, interfaces and applicable controls for energy analytics, ai and production decisions: evidence and decision gates. Decisions require current information, role-appropriate authority, competent review and documented assumptions.

Worked example. Use an applied Namibia-relevant case in which a team plans energy analytics, ai and production decisions: evidence and decision gates while balancing safety, integrity, schedule, cost, environmental protection and local capability.

Facilitator prompts. Ask learners to distinguish verified facts from assumptions, identify who has decision authority, name stop-work triggers and state what evidence could change their recommendation. Compare technical, HSE, commercial and community perspectives.

Activity. Prepare a decision brief for energy analytics, ai and production decisions: evidence and decision gates: scope, evidence, assumptions, hazards, safeguards, owner, decision gate and escalation trigger.

Model answer guide. A sound response defines scope; uses current, traceable evidence; applies approved requirements and controls; records assumptions; assigns competent owners; checks interfaces; and communicates a measurable decision with an escalation path.

Assessment evidence. Score accuracy (30%), use of evidence (20%), safeguards (20%), analysis (20%) and communication (10%).

Applied activity

Prepare a decision brief for energy analytics, ai and production decisions: evidence and decision gates: scope, evidence, assumptions, hazards, safeguards, owner, decision gate and escalation trigger.

Assessment

Formative: 10-question practice quiz with answer feedback

Summative: Applied decision brief or practical case assessed against the rubric; proposed pass mark 70%, subject to academic approval.

Practice

Use the separate Academy practice questions and answer key page for this module.

Module 5: Crude oil quality and assay interpretation

Learning objectives

- Explain crude oil quality and assay interpretation, interpret a case, select appropriate controls and justify a documented decision.

Lessons

1. Purpose and key terms of Crude oil quality and assay interpretation
2. Systems and operating context
3. Evidence, assumptions and decision gates
4. Hazards, safeguards and escalation
5. Applied case: Energy Analytics, AI and Production Decisions

Detailed teaching notes

Teaching notes

Core explanation. Crude properties include density, sulfur, acidity, metals, salt, water and distillation behaviour. API gravity is a density scale, not a complete quality grade. Explain how crude assay and sampling representativeness affect refinery fit and valuation.

Decision logic. A light crude can still present processing or materials challenges. Compare whole-crude properties with fraction yields and contaminants. Distinguish a laboratory result, a contractual specification and a refinery's acceptable feed envelope.

Worked example. Two hypothetical crudes have similar API gravity but very different sulfur and metals contents.

Facilitator prompts. Ask learners to distinguish verified facts from assumptions, identify who has decision authority, name stop-work triggers and state what evidence could change their recommendation. Compare technical, HSE, commercial and community perspectives.

Activity. Compare the two fictional assays and list additional data needed for refinery selection.

Model answer guide. Include contaminant management, fraction yields, blending and sampling quality; avoid ranking by API gravity alone.

Assessment evidence. Score accuracy (30%), use of evidence (20%), safeguards (20%), analysis (20%) and communication (10%).

Applied activity

Compare the two fictional assays and list additional data needed for refinery selection.

Assessment

Formative: 10-question practice quiz with answer feedback

Summative: Applied decision brief or practical case assessed against the rubric; proposed pass mark 70%, subject to academic approval.

Practice

Use the separate Academy practice questions and answer key page for this module.

Module 6: SCADA DCS and integrated control systems

Learning objectives

- Explain scada dcs and integrated control systems, interpret a case, select appropriate controls and justify a documented decision.

Lessons

1. Purpose and key terms of SCADA DCS and integrated control systems
2. Systems and operating context
3. Evidence, assumptions and decision gates
4. Hazards, safeguards and escalation
5. Applied case: Energy Analytics, AI and Production Decisions

Detailed teaching notes

Teaching notes

Core explanation. Control systems acquire signals, execute logic and support operator actions. SCADA, DCS and integrated control architectures differ by context; safety functions require appropriate separation and assurance. Explain sensor, controller, final element and human interface.

Decision logic. Alarm and control design must match process needs and human capability. More alarms do not necessarily improve safety. Changes to logic require controlled review, testing and approval. This course uses simulation only and provides no live-system modification instructions.

Worked example. An alarm floods the operator screen during a simulated upset, obscuring the initiating condition.

Facilitator prompts. Ask learners to distinguish verified facts from assumptions, identify who has decision authority, name stop-work triggers and state what evidence could change their recommendation. Compare technical, HSE, commercial and community perspectives.

Activity. Map a control loop and evaluate an alarm list for prioritisation questions.

Model answer guide. Identify measurement, logic, final element and feedback, with rationalised alarms and change control.

Assessment evidence. Score accuracy (30%), use of evidence (20%), safeguards (20%), analysis (20%) and communication (10%).

Applied activity

Map a control loop and evaluate an alarm list for prioritisation questions.

Assessment

Formative: 10-question practice quiz with answer feedback

Summative: Applied decision brief or practical case assessed against the rubric; proposed pass mark 70%, subject to academic approval.

Practice

Use the separate Academy practice questions and answer key page for this module.

Module 7: Petroleum policy and institutional governance

Learning objectives

- Explain petroleum policy and institutional governance, interpret a case, select appropriate controls and justify a documented decision.

Lessons

1. Purpose and key terms of Petroleum policy and institutional governance
2. Systems and operating context
3. Evidence, assumptions and decision gates
4. Hazards, safeguards and escalation
5. Applied case: Energy Analytics, AI and Production Decisions

Detailed teaching notes

Teaching notes

Core explanation. Policy sets objectives, institutions assign authority, and governance creates accountability for decisions and resources. Explain government, regulator and state enterprise roles conceptually without asserting an unverified current Namibian structure.

Decision logic. Separate commercial participation from regulatory judgement and manage conflicts transparently. Define decision rights, disclosure, assurance and challenge. A strong governance design includes implementation capacity and an audit trail, not just an organisation chart.

Worked example. A fictional institution both promotes investment and evaluates its own project compliance, creating a conflict to manage.

Facilitator prompts. Ask learners to distinguish verified facts from assumptions, identify who has decision authority, name stop-work triggers and state what evidence could change their recommendation. Compare technical, HSE, commercial and community perspectives.

Activity. Draft a responsibility matrix and conflict-management controls.

Model answer guide. Identify segregated decisions, independent review, declarations and public accountability where applicable.

Assessment evidence. Score accuracy (30%), use of evidence (20%), safeguards (20%), analysis (20%) and communication (10%).

Applied activity

Draft a responsibility matrix and conflict-management controls.

Assessment

Formative: 10-question practice quiz with answer feedback

Summative: Applied decision brief or practical case assessed against the rubric; proposed pass mark 70%, subject to academic approval.

Practice

Use the separate Academy practice questions and answer key page for this module.

Module 8: Energy Analytics, AI and Production Decisions: Communication ar

Learning objectives

- Explain energy analytics, ai and production decisions: communication and escalation, interpret a case, select appropriate controls and justify a documented decision.

Lessons

1. Purpose and key terms of Energy Analytics, AI and Production Decisions: Communication and Escalation

2. Systems and operating context

3. Evidence, assumptions and decision gates

4. Hazards, safeguards and escalation

5. Applied case: Energy Analytics, AI and Production Decisions

Detailed teaching notes

Teaching notes

Core explanation. Energy Analytics, AI and Production Decisions: Communication and Escalation describes a practical part of Energy Analytics, AI and Production Decisions. Learners connect the principles to asset performance, people, operational risk, project value and local context.

Decision logic. Review the objective, evidence, limits, interfaces and applicable controls for energy analytics, ai and production decisions: communication and escalation. Decisions require current information, role-appropriate authority, competent review and documented assumptions.

Worked example. Use an applied Namibia-relevant case in which a team plans energy analytics, ai and production decisions: communication and escalation while balancing safety, integrity, schedule, cost, environmental protection and local capability.

Facilitator prompts. Ask learners to distinguish verified facts from assumptions, identify who has decision authority, name stop-work triggers and state what evidence could change their recommendation. Compare technical, HSE, commercial and community perspectives.

Activity. Prepare a decision brief for energy analytics, ai and production decisions: communication and escalation: scope, evidence, assumptions, hazards, safeguards, owner, decision gate and escalation trigger.

Model answer guide. A sound response defines scope; uses current, traceable evidence; applies approved requirements and controls; records assumptions; assigns competent owners; checks interfaces; and communicates a measurable decision with an escalation path.

Assessment evidence. Score accuracy (30%), use of evidence (20%), safeguards (20%), analysis (20%) and communication (10%).

Applied activity

Prepare a decision brief for energy analytics, ai and production decisions: communication and escalation: scope, evidence, assumptions, hazards, safeguards, owner, decision gate and escalation trigger.

Assessment

Formative: 10-question practice quiz with answer feedback

Summative: Applied decision brief or practical case assessed against the rubric; proposed pass mark 70%, subject to academic approval.

Practice

Use the separate Academy practice questions and answer key page for this module.

Module 9: Energy Analytics, AI and Production Decisions: Knowledge Check

Learning objectives

- Explain energy analytics, ai and production decisions: knowledge check, interpret a case, select appropriate controls and justify a documented decision.

Lessons

1. Purpose and key terms of Energy Analytics, AI and Production Decisions: Knowledge Check
2. Systems and operating context
3. Evidence, assumptions and decision gates
4. Hazards, safeguards and escalation
5. Applied case: Energy Analytics, AI and Production Decisions

Detailed teaching notes

Teaching notes

Core explanation. Energy Analytics, AI and Production Decisions: Knowledge Check describes a practical part of Energy Analytics, AI and Production Decisions. Learners connect the principles to asset performance, people, operational risk, project value and local context.

Decision logic. Review the objective, evidence, limits, interfaces and applicable controls for energy analytics, ai and production decisions: knowledge check. Decisions require current information, role-appropriate authority, competent review and documented assumptions.

Worked example. Use an applied Namibia-relevant case in which a team plans energy analytics, ai and production decisions: knowledge check while balancing safety, integrity, schedule, cost, environmental protection and local capability.

Facilitator prompts. Ask learners to distinguish verified facts from assumptions, identify who has decision authority, name stop-work triggers and state what evidence could change their recommendation. Compare technical, HSE, commercial and community perspectives.

Activity. Prepare a decision brief for energy analytics, ai and production decisions: knowledge check: scope, evidence, assumptions, hazards, safeguards, owner, decision gate and escalation trigger.

Model answer guide. A sound response defines scope; uses current, traceable evidence; applies approved requirements and controls; records assumptions; assigns competent owners; checks interfaces; and communicates a measurable decision with an escalation path.

Assessment evidence. Score accuracy (30%), use of evidence (20%), safeguards (20%), analysis (20%) and communication (10%).

Applied activity

Prepare a decision brief for energy analytics, ai and production decisions: knowledge check: scope, evidence, assumptions, hazards, safeguards, owner, decision gate and escalation trigger.

Assessment

Formative: 10-question practice quiz with answer feedback

Summative: Applied decision brief or practical case assessed against the rubric; proposed pass mark 70%, subject to academic approval.

Practice

Use the separate Academy practice questions and answer key page for this module.

Module 10: Energy Analytics, AI and Production Decisions: Competence Rev

Learning objectives

- Explain energy analytics, ai and production decisions: competence review, interpret a case, select appropriate controls and justify a documented decision.

Lessons

1. Purpose and key terms of Energy Analytics, AI and Production Decisions: Competence Review
2. Systems and operating context
3. Evidence, assumptions and decision gates
4. Hazards, safeguards and escalation
5. Applied case: Energy Analytics, AI and Production Decisions

Detailed teaching notes

Teaching notes

Core explanation. Energy Analytics, AI and Production Decisions: Competence Review describes a practical part of Energy Analytics, AI and Production Decisions. Learners connect the principles to asset performance, people, operational risk, project value and local context.

Decision logic. Review the objective, evidence, limits, interfaces and applicable controls for energy analytics, ai and production decisions: competence review. Decisions require current information, role-appropriate authority, competent review and documented assumptions.

Worked example. Use an applied Namibia-relevant case in which a team plans energy analytics, ai and production decisions: competence review while balancing safety, integrity, schedule, cost, environmental protection and local capability.

Facilitator prompts. Ask learners to distinguish verified facts from assumptions, identify who has decision authority, name stop-work triggers and state what evidence could change their recommendation. Compare technical, HSE, commercial and community perspectives.

Activity. Prepare a decision brief for energy analytics, ai and production decisions: competence review: scope, evidence, assumptions, hazards, safeguards, owner, decision gate and escalation trigger.

Model answer guide. A sound response defines scope; uses current, traceable evidence; applies approved requirements and controls; records assumptions; assigns competent owners; checks interfaces; and communicates a measurable decision with an escalation path.

Assessment evidence. Score accuracy (30%), use of evidence (20%), safeguards (20%), analysis (20%) and communication (10%).

Applied activity

Prepare a decision brief for energy analytics, ai and production decisions: competence review: scope, evidence, assumptions, hazards, safeguards, owner, decision gate and escalation trigger.

Assessment

Formative: 10-question practice quiz with answer feedback

Summative: Applied decision brief or practical case assessed against the rubric; proposed pass mark 70%, subject to academic approval.

Practice

Use the separate Academy practice questions and answer key page for this module.

Facilitator close-out and resources

Facilitator close-out

Record attendance, assessment evidence, learner support needs, incidents and improvement actions according to approved provider processes. Do not sign learners off for regulated or safety-critical work without the authorised assessment and certification route.

Resources and references

- Supplied GExperts/IUM reference materials; verify reuse rights and currentness.
- Current applicable Namibian legislation, standards and approved site procedures supplied by the provider.
- Case worksheet and instructor slides must be produced and reviewed before course release.