Industrial Instrumentation and Control Technician

GExperts Learning Academy | TV-X07 | TV | 3-12 months

Course overview

3-12 months TV programme focused on Industrial Instrumentation and Control Technician, using energy-sector cases and applied decisions.

Designed for: Trade entrants with supervised practical assessment

Learning outcomes

- Explain core principles and terminology for Industrial Instrumentation and Control Technician.
- 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=TV-X07

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 instrumentation

Learning objectives

- Explain industrial instrumentation, interpret a case, select appropriate controls and justify a documented decision.

Lessons

1. Purpose and key terms of Industrial instrumentation
2. Systems and operating context
3. Evidence, assumptions and decision gates
4. Hazards, safeguards and escalation
5. Applied case: Industrial Instrumentation and Control Technician

Detailed teaching notes

Teaching notes

Core explanation. Sensors and transmitters convert process conditions into signals. Teach range, span, accuracy, calibration and measurement uncertainty. Pressure, temperature, flow and level measurements use different principles and installation constraints.

Decision logic. Trace a measurement from process interface through signal conversion to display. Incorrect range or units can mislead control and operations. An apparently stable value may be frozen or invalid. Actual instrument work follows authorised isolation and manufacturer procedures.

Worked example. A 4-20 mA signal represents 0-100 units; 12 mA corresponds to 50 units under a linear mapping.

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. Calculate the indicated value at 8 mA and identify assumptions.

Model answer guide. Twenty-five units with linear mapping and a valid signal; check range and status.

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

Applied activity

Calculate the indicated value at 8 mA and identify assumptions.

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: 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: Industrial Instrumentation and Control Technician

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 3: Industrial Instrumentation and Control Technician: Systems and In

Learning objectives

- Explain industrial instrumentation and control technician: systems and interfaces, interpret a case, select appropriate controls and justify a documented decision.

Lessons

1. Purpose and key terms of Industrial Instrumentation and Control Technician: Systems and Interfaces
2. Systems and operating context
3. Evidence, assumptions and decision gates
4. Hazards, safeguards and escalation
5. Applied case: Industrial Instrumentation and Control Technician

Detailed teaching notes

Teaching notes

Core explanation. Industrial Instrumentation and Control Technician: Systems and Interfaces describes a practical part of Industrial Instrumentation and Control Technician. 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 industrial instrumentation and control technician: systems and interfaces. 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 industrial instrumentation and control technician: systems and interfaces 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 industrial instrumentation and control technician: systems and interfaces: 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 industrial instrumentation and control technician: systems and interfaces: 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 4: Industrial Instrumentation and Control Technician: Evidence and D

Learning objectives

- Explain industrial instrumentation and control technician: evidence and decision gates, interpret a case, select appropriate controls and justify a documented decision.

Lessons

1. Purpose and key terms of Industrial Instrumentation and Control Technician: Evidence and Decision Gates
2. Systems and operating context
3. Evidence, assumptions and decision gates
4. Hazards, safeguards and escalation
5. Applied case: Industrial Instrumentation and Control Technician

Detailed teaching notes

Teaching notes

Core explanation. Industrial Instrumentation and Control Technician: Evidence and Decision Gates describes a practical part of Industrial Instrumentation and Control Technician. 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 industrial instrumentation and control technician: 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 industrial instrumentation and control technician: 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 industrial instrumentation and control technician: 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 industrial instrumentation and control technician: 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: Construction hook up and commissioning

Learning objectives

- Explain construction hook up and commissioning, interpret a case, select appropriate controls and justify a documented decision.

Lessons

1. Purpose and key terms of Construction hook up and commissioning
2. Systems and operating context
3. Evidence, assumptions and decision gates
4. Hazards, safeguards and escalation
5. Applied case: Industrial Instrumentation and Control Technician

Detailed teaching notes

Teaching notes

Core explanation. Mechanical completion confirms construction against defined scope; commissioning demonstrates functional readiness; startup introduces operational service under approved controls. These milestones require different evidence. Introduce systemisation, punch lists and handover boundaries.

Decision logic. Readiness is demonstrated through test records, resolved defects, procedures, trained personnel and accepted interfaces. Schedule pressure does not justify silently transferring incomplete systems. Brownfield work must address interactions with operating equipment and simultaneous activities.

Worked example. A system is mechanically complete but its cause-and-effect tests remain outstanding.

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. Classify a fictional punch list by startup consequence and propose handover conditions.

Model answer guide. Identify safety-critical tests and documented acceptance; mechanical completion alone is insufficient.

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

Applied activity

Classify a fictional punch list by startup consequence and propose handover conditions.

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: Industrial Instrumentation and Control Technician: Data and Perfo

Learning objectives

- Explain industrial instrumentation and control technician: data and performance, interpret a case, select appropriate controls and justify a documented decision.

Lessons

1. Purpose and key terms of Industrial Instrumentation and Control Technician: Data and Performance
2. Systems and operating context
3. Evidence, assumptions and decision gates
4. Hazards, safeguards and escalation
5. Applied case: Industrial Instrumentation and Control Technician

Detailed teaching notes

Teaching notes

Core explanation. Industrial Instrumentation and Control Technician: Data and Performance describes a practical part of Industrial Instrumentation and Control Technician. 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 industrial instrumentation and control technician: data and performance. 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 industrial instrumentation and control technician: data and performance 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 industrial instrumentation and control technician: data and performance: 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 industrial instrumentation and control technician: data and performance: 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 7: Industrial Instrumentation and Control Technician: Applied Case

Learning objectives

- Explain industrial instrumentation and control technician: applied case, interpret a case, select appropriate controls and justify a documented decision.

Lessons

1. Purpose and key terms of Industrial Instrumentation and Control Technician: Applied Case
2. Systems and operating context
3. Evidence, assumptions and decision gates
4. Hazards, safeguards and escalation
5. Applied case: Industrial Instrumentation and Control Technician

Detailed teaching notes

Teaching notes

Core explanation. Industrial Instrumentation and Control Technician: Applied Case describes a practical part of Industrial Instrumentation and Control Technician. 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 industrial instrumentation and control technician: applied case. 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 industrial instrumentation and control technician: applied case 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 industrial instrumentation and control technician: applied case: 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 industrial instrumentation and control technician: applied case: 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 8: Industrial Instrumentation and Control Technician: Communicatio

Learning objectives

- Explain industrial instrumentation and control technician: communication and escalation, interpret a case, select appropriate controls and justify a documented decision.

Lessons

1. Purpose and key terms of Industrial Instrumentation and Control Technician: Communication and Escalation
2. Systems and operating context
3. Evidence, assumptions and decision gates
4. Hazards, safeguards and escalation
5. Applied case: Industrial Instrumentation and Control Technician

Detailed teaching notes

Teaching notes

Core explanation. Industrial Instrumentation and Control Technician: Communication and Escalation describes a practical part of Industrial Instrumentation and Control Technician. 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 industrial instrumentation and control technician: 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 industrial instrumentation and control technician: 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 industrial instrumentation and control technician: 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 industrial instrumentation and control technician: 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: Industrial Instrumentation and Control Technician: Knowledge Che

Learning objectives

- Explain industrial instrumentation and control technician: knowledge check, interpret a case, select appropriate controls and justify a documented decision.

Lessons

1. Purpose and key terms of Industrial Instrumentation and Control Technician: Knowledge Check
2. Systems and operating context
3. Evidence, assumptions and decision gates
4. Hazards, safeguards and escalation
5. Applied case: Industrial Instrumentation and Control Technician

Detailed teaching notes

Teaching notes

Core explanation. Industrial Instrumentation and Control Technician: Knowledge Check describes a practical part of Industrial Instrumentation and Control Technician. 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 industrial instrumentation and control technician: 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 industrial instrumentation and control technician: 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 industrial instrumentation and control technician: 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 industrial instrumentation and control technician: 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: Industrial Instrumentation and Control Technician: Competence R

Learning objectives

- Explain industrial instrumentation and control technician: competence review, interpret a case, select appropriate controls and justify a documented decision.

Lessons

1. Purpose and key terms of Industrial Instrumentation and Control Technician: Competence Review
2. Systems and operating context
3. Evidence, assumptions and decision gates
4. Hazards, safeguards and escalation
5. Applied case: Industrial Instrumentation and Control Technician

Detailed teaching notes

Teaching notes

Core explanation. Industrial Instrumentation and Control Technician: Competence Review describes a practical part of Industrial Instrumentation and Control Technician. 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 industrial instrumentation and control technician: 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 industrial instrumentation and control technician: 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 industrial instrumentation and control technician: 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 industrial instrumentation and control technician: 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.