Certificate in Subsea Systems, FPSO and Marine Operations

GExperts Learning Academy | C-023 | C | 12 weeks

Course overview

12 weeks C programme focused on Certificate in Subsea Systems, FPSO and Marine Operations, using energy-sector cases and applied decisions.

Designed for: Learners appropriate to the stated programme level

Learning outcomes

- Explain core principles and terminology for Certificate in Subsea Systems, FPSO and Marine Operations.
- 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=C-023

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: Deepwater development concept selection

Learning objectives

- Explain deepwater development concept selection, interpret a case, select appropriate controls and justify a documented decision.

Lessons

1. Purpose and key terms of Deepwater development concept selection
2. Systems and operating context
3. Evidence, assumptions and decision gates
4. Hazards, safeguards and escalation
5. Applied case: Certificate in Subsea Systems, FPSO and Marine Operations

Detailed teaching notes

Teaching notes

Core explanation. Compare subsea tieback, standalone floating production and shore-linked concepts against reservoir, metocean, water depth, distance and product requirements. A concept is an integrated system of wells, facilities, export and support infrastructure. Show the interfaces before scoring alternatives.

Decision logic. Apply mandatory constraints before weighted scoring. Document weighting, uncertainty and options that fail a hard requirement. Lowest capital cost may increase operating risk or reduce recovery. Revisit selection when appraisal or market evidence changes.

Worked example. Concept A costs less initially but cannot accommodate the high gas case; Concept B has expansion capacity.

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 concept matrix with technical, commercial, environmental and local-capability criteria.

Model answer guide. Reject infeasible options before ranking and include lifecycle cost, flexibility and uncertainty.

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

Applied activity

Prepare a concept matrix with technical, commercial, environmental and local-capability criteria.

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: Subsea trees and wellheads

Learning objectives

- Explain subsea trees and wellheads, interpret a case, select appropriate controls and justify a documented decision.

Lessons

1. Purpose and key terms of Subsea trees and wellheads
2. Systems and operating context
3. Evidence, assumptions and decision gates
4. Hazards, safeguards and escalation
5. Applied case: Certificate in Subsea Systems, FPSO and Marine Operations

Detailed teaching notes

Teaching notes

Core explanation. The wellhead supports well interfaces; the tree provides controlled flow paths and isolation functions. Distinguish production, annulus and intervention interfaces. Explain that equipment configuration depends on well design and operating requirements, not a universal diagram.

Decision logic. Selection considers pressure, temperature, fluid service, installation, control compatibility and intervention access. Track interface documents and qualification evidence. An equipment rating alone does not prove the installed system is suitable or verified.

Worked example. A replacement connector has adequate pressure rating but an incompatible mechanical interface.

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. Review a fictional tree interface sheet and flag mismatches.

Model answer guide. Check mechanical, hydraulic, electrical, control and material compatibility; require approved verification.

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

Applied activity

Review a fictional tree interface sheet and flag mismatches.

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: Manifolds flowlines and risers

Learning objectives

- Explain manifolds flowlines and risers, interpret a case, select appropriate controls and justify a documented decision.

Lessons

1. Purpose and key terms of Manifolds flowlines and risers
2. Systems and operating context
3. Evidence, assumptions and decision gates
4. Hazards, safeguards and escalation
5. Applied case: Certificate in Subsea Systems, FPSO and Marine Operations

Detailed teaching notes

Teaching notes

Core explanation. Manifolds collect and distribute flows; flowlines transport seabed fluids; risers bridge the seabed and floating facility. Distinguish production, injection and service lines. Show mechanical, thermal and hydraulic interfaces in one field layout.

Decision logic. Assess pressure drop, thermal loss, fatigue, seabed interaction and installation constraints together. Flowline diameter is a system tradeoff, not simply a maximum-flow choice. Routing must consider environmental and operational constraints and future inspection access.

Worked example. A shorter route crosses difficult seabed terrain, while a longer route reduces installation and inspection difficulty.

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 two routing options and record the evidence needed for selection.

Model answer guide. Use lifecycle integrity, hydraulics, constructability, environment and access; do not select by length alone.

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

Applied activity

Compare two routing options and record the evidence needed for 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 4: Umbilicals and subsea control systems

Learning objectives

- Explain umbilicals and subsea control systems, interpret a case, select appropriate controls and justify a documented decision.

Lessons

1. Purpose and key terms of Umbilicals and subsea control systems
2. Systems and operating context
3. Evidence, assumptions and decision gates
4. Hazards, safeguards and escalation
5. Applied case: Certificate in Subsea Systems, FPSO and Marine Operations

Detailed teaching notes

Teaching notes

Core explanation. Umbilicals transmit combinations of power, communications, hydraulic service and chemicals. Subsea controls command and monitor equipment. Use a signal-and-energy diagram to separate commands, feedback and physical actuation.

Decision logic. Control philosophy must address loss of power, communications and hydraulic supply, plus the intended safe response. Check compatibility and redundancy across surface and subsea equipment. A command acknowledgement does not necessarily prove final valve position.

Worked example. A control command is received, but independent position feedback disagrees. Investigate rather than assume successful actuation.

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. Trace one command path and identify three failure points and their indication.

Model answer guide. Include surface control, communication, power or hydraulic supply and feedback; distinguish received command from achieved state.

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

Applied activity

Trace one command path and identify three failure points and their indication.

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: Flow assurance

Learning objectives

- Explain flow assurance, interpret a case, select appropriate controls and justify a documented decision.

Lessons

1. Purpose and key terms of Flow assurance
2. Systems and operating context
3. Evidence, assumptions and decision gates
4. Hazards, safeguards and escalation
5. Applied case: Certificate in Subsea Systems, FPSO and Marine Operations

Detailed teaching notes

Teaching notes

Core explanation. Flow assurance manages the ability to transport fluids through operating and transient conditions. Hydrates, wax, scale, corrosion and slugging can threaten performance. Explain the pressure-temperature-composition relationship qualitatively with a cooling pipeline sketch.

Decision logic. Assess startup, shutdown and restart as well as steady operation. Chemical treatment, insulation and operating strategies interact with facilities and environmental constraints. Classroom discussion does not prescribe inhibitor doses or live restart sequences.

Worked example. A pipeline flows normally when warm but cools during a long shutdown, changing restart risk.

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. Build a flow-assurance risk register for normal operation and shutdown.

Model answer guide. Include fluid data, thermal history, safeguards, monitoring and an authorised specialist review before restart.

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

Applied activity

Build a flow-assurance risk register for normal operation and shutdown.

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: FPSO processing storage and offloading

Learning objectives

- Explain fpso processing storage and offloading, interpret a case, select appropriate controls and justify a documented decision.

Lessons

1. Purpose and key terms of FPSO processing storage and offloading
2. Systems and operating context
3. Evidence, assumptions and decision gates
4. Hazards, safeguards and escalation
5. Applied case: Certificate in Subsea Systems, FPSO and Marine Operations

Detailed teaching notes

Teaching notes

Core explanation. An FPSO receives production, separates fluids, treats streams, stores oil and transfers cargo to export vessels. Explain topsides, hull, marine systems and offloading interfaces. Storage capacity is different from processing capacity.

Decision logic. Link processing limits to reservoir fluid cases and marine availability. A delay in offloading can constrain production even if process equipment is healthy. Discuss integration between process safety, marine assurance, maintenance and cargo scheduling.

Worked example. A fictional FPSO processes 100,000 barrels/day and has 500,000 barrels of free storage, providing five days before storage fills at unchanged output.

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 free-storage endurance and list mitigations requiring review.

Model answer guide. Five days under simplified assumptions; review offloading schedule, safe operating limits and controlled production planning.

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

Applied activity

Calculate free-storage endurance and list mitigations requiring review.

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: Marine operations and station keeping

Learning objectives

- Explain marine operations and station keeping, interpret a case, select appropriate controls and justify a documented decision.

Lessons

1. Purpose and key terms of Marine operations and station keeping
2. Systems and operating context
3. Evidence, assumptions and decision gates
4. Hazards, safeguards and escalation
5. Applied case: Certificate in Subsea Systems, FPSO and Marine Operations

Detailed teaching notes

Teaching notes

Core explanation. Floating facilities and vessels maintain position through mooring, dynamic positioning or combinations appropriate to their design. Marine operations depend on weather, equipment condition and personnel competence. Explain station-keeping failure consequences for risers, lines and transfer operations.

Decision logic. Operating windows are vessel- and task-specific. Review weather forecasts, redundancy, assurance and abort criteria before work. Do not use classroom numbers as vessel limits. Interface plans should define who can pause the operation and how changes are communicated.

Worked example. An operation remains within yesterday's forecast but the latest forecast deteriorates during the planned work window.

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 go-or-defer briefing identifying information needed, authority and contingency.

Model answer guide. Use current metocean data, approved limits, equipment status and safe disengagement planning.

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

Applied activity

Prepare a go-or-defer briefing identifying information needed, authority and contingency.

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: Inspection planning and technologies

Learning objectives

- Explain inspection planning and technologies, interpret a case, select appropriate controls and justify a documented decision.

Lessons

1. Purpose and key terms of Inspection planning and technologies
2. Systems and operating context
3. Evidence, assumptions and decision gates
4. Hazards, safeguards and escalation
5. Applied case: Certificate in Subsea Systems, FPSO and Marine Operations

Detailed teaching notes

Teaching notes

Core explanation. Inspection seeks evidence of condition and degradation using methods fit for the expected damage. Coverage, access, resolution and operator competence affect confidence. Distinguish visual survey, thickness measurement and detailed examination.

Decision logic. Start with the question being answered, then select method and locations. A clean report from limited coverage does not prove the whole asset is defect-free. Record limitations, traceability, findings and required engineering disposition.

Worked example. An external visual survey cannot establish internal wall thickness beneath insulation.

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. Design an inspection brief with objective, coverage, method and reporting limits.

Model answer guide. Match technique to mechanism and state what cannot be concluded.

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

Applied activity

Design an inspection brief with objective, coverage, method and reporting limits.

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: Offshore supply base operations

Learning objectives

- Explain offshore supply base operations, interpret a case, select appropriate controls and justify a documented decision.

Lessons

1. Purpose and key terms of Offshore supply base operations
2. Systems and operating context
3. Evidence, assumptions and decision gates
4. Hazards, safeguards and escalation
5. Applied case: Certificate in Subsea Systems, FPSO and Marine Operations

Detailed teaching notes

Teaching notes

Core explanation. A supply base connects procurement, warehousing, vessel movements and offshore demand. Explain receiving, inspection, storage, picking, packing, manifesting and dispatch. Errors at these interfaces can delay work or create safety risks offshore.

Decision logic. Plan around vessel capacity, weather, priorities and return logistics. Maintain segregation, traceability and quality holds. A fast dispatch is unsuccessful if cargo is wrong or unusable. Use synthetic manifests and no actual customs declarations.

Worked example. A spare is dispatched urgently but lacks the required preservation and identification.

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. Trace the spare from purchase request to offshore receipt and identify control points.

Model answer guide. Include identity, condition, documentation, packing, manifest and receiving confirmation.

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

Applied activity

Trace the spare from purchase request to offshore receipt and identify control points.

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: Certificate in Subsea Systems, FPSO and Marine Operations: Cor

Learning objectives

- Explain certificate in subsea systems, fpso and marine operations: competence review, interpret a case, select appropriate controls and justify a documented decision.

Lessons

1. Purpose and key terms of Certificate in Subsea Systems, FPSO and Marine Operations: Competence Review
2. Systems and operating context
3. Evidence, assumptions and decision gates
4. Hazards, safeguards and escalation
5. Applied case: Certificate in Subsea Systems, FPSO and Marine Operations

Detailed teaching notes

Teaching notes

Core explanation. Certificate in Subsea Systems, FPSO and Marine Operations: Competence Review describes a practical part of Certificate in Subsea Systems, FPSO and Marine Operations. 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 certificate in subsea systems, fpso and marine operations: 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 certificate in subsea systems, fpso and marine operations: 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 certificate in subsea systems, fpso and marine operations: 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 certificate in subsea systems, fpso and marine operations: 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.