Petroleum Geology for Non-Geoscientists

GExperts Learning Academy | SC-003 | SC | 2 days

Course overview

2 days SC programme focused on Petroleum Geology for Non-Geoscientists, using energy-sector cases and applied decisions.

Designed for: Learners appropriate to the stated programme level

Learning outcomes

- Explain core principles and terminology for Petroleum Geology for Non-Geoscientists.
- 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=SC-003

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: Petroleum systems and basin analysis

Learning objectives

- Explain petroleum systems and basin analysis, interpret a case, select appropriate controls and justify a documented decision.

Lessons

1. Purpose and key terms of Petroleum systems and basin analysis
2. Systems and operating context
3. Evidence, assumptions and decision gates
4. Hazards, safeguards and escalation
5. Applied case: Petroleum Geology for Non-Geoscientists

Detailed teaching notes

Teaching notes

Core explanation. Source rock generates hydrocarbons after sufficient burial and heating. Migration moves fluids toward reservoir rock; a seal and trap retain them. Timing matters: a trap formed after migration may be uncharged. Draw an events chart alongside a basin cross-section.

Decision logic. Separate regional play evidence from prospect-specific evidence. Basin analogues help frame hypotheses but cannot prove reservoir quality or charge in a new location. Ask what observation would falsify each element of the proposed petroleum system.

Worked example. A mapped trap exists, but the migration pathway is uncertain. Increasing trap area does not solve charge uncertainty.

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. Construct an elements-and-processes matrix with evidence, uncertainty and a next test.

Model answer guide. Require source, maturity, migration, reservoir, seal, trap and timing; identify charge as an unresolved dependency.

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

Applied activity

Construct an elements-and-processes matrix with evidence, uncertainty and a next test.

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: Structural geology and trapping

Learning objectives

- Explain structural geology and trapping, interpret a case, select appropriate controls and justify a documented decision.

Lessons

1. Purpose and key terms of Structural geology and trapping
2. Systems and operating context
3. Evidence, assumptions and decision gates
4. Hazards, safeguards and escalation
5. Applied case: Petroleum Geology for Non-Geoscientists

Detailed teaching notes

Teaching notes

Core explanation. Faults and folds alter reservoir geometry and can create closures. A fault can transmit or restrict flow depending on juxtaposition, fault-zone properties and stress. Explain structure contours and spill points using a simple tilted layer rather than a decorative map.

Decision logic. Interpretation should preserve multiple fault geometries where data are ambiguous. Check closure against depth uncertainty, reservoir juxtaposition and potential leakage. A fault polygon on a map is not direct proof of a sealing fault.

Worked example. Two interpretations place the spill point at different depths, changing closure area. Retain both cases until tied to better evidence.

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. Sketch a faulted closure, label spill point and propose a fault-seal uncertainty test.

Model answer guide. Credit consistent geometry and an explicit seal hypothesis; do not award certainty based only on fault presence.

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

Applied activity

Sketch a faulted closure, label spill point and propose a fault-seal uncertainty test.

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: Sedimentology and stratigraphy

Learning objectives

- Explain sedimentology and stratigraphy, interpret a case, select appropriate controls and justify a documented decision.

Lessons

1. Purpose and key terms of Sedimentology and stratigraphy
2. Systems and operating context
3. Evidence, assumptions and decision gates
4. Hazards, safeguards and escalation
5. Applied case: Petroleum Geology for Non-Geoscientists

Detailed teaching notes

Teaching notes

Core explanation. Depositional processes control grain size, sorting and architecture. Deepwater channels and lobes can form reservoirs, while mud-rich intervals may compartmentalise flow. Stratigraphy relates rock packages through time; lithological similarity alone does not prove hydraulic connection.

Decision logic. Use core, logs and seismic together. Explain how channel stacking changes net-to-gross and connectivity. Contrast a continuous sand body with isolated lenses, then ask how the same total sand volume can produce different well performance.

Worked example. Two wells contain sand at similar depths, but an intervening mud-rich channel margin could prevent communication.

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 two alternative depositional models from fictional well descriptions.

Model answer guide. Both models should honour observations and identify a discriminating observation such as pressure communication or additional seismic evidence.

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

Applied activity

Build two alternative depositional models from fictional well descriptions.

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: Volumetric estimation

Learning objectives

- Explain volumetric estimation, interpret a case, select appropriate controls and justify a documented decision.

Lessons

1. Purpose and key terms of Volumetric estimation
2. Systems and operating context
3. Evidence, assumptions and decision gates
4. Hazards, safeguards and escalation
5. Applied case: Petroleum Geology for Non-Geoscientists

Detailed teaching notes

Teaching notes

Core explanation. Oil initially in place can be estimated from bulk rock volume, net-to-gross, porosity and hydrocarbon saturation, divided by oil formation volume factor. Keep all units consistent. In-place oil is different from recoverable resources, which require recovery and development assumptions.

Decision logic. Avoid combining unrelated optimistic parameters into an unlabelled base case. Preserve dependence between area, thickness and reservoir quality. Present ranges and indicate which measurements drive uncertainty. Recovery factor is a scenario assumption until supported by reservoir evaluation.

Worked example. Using SI volumes: 1 million cubic metres bulk rock, NTG 0.5, porosity 0.2, oil saturation 0.7 and Bo 1.2 gives about 58,333 stock-tank cubic metres in place.

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. Recalculate after halving net-to-gross and interpret the result.

Model answer guide. The estimate halves to about 29,167 cubic metres; this remains in-place oil, not booked reserves.

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

Applied activity

Recalculate after halving net-to-gross and interpret the result.

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: Petroleum Geology for Non-Geoscientists: Work Planning

Learning objectives

- Explain petroleum geology for non-geoscientists: work planning, interpret a case, select appropriate controls and justify a documented decision.

Lessons

1. Purpose and key terms of Petroleum Geology for Non-Geoscientists: Work Planning
2. Systems and operating context
3. Evidence, assumptions and decision gates
4. Hazards, safeguards and escalation
5. Applied case: Petroleum Geology for Non-Geoscientists

Detailed teaching notes

Teaching notes

Core explanation. Petroleum Geology for Non-Geoscientists: Work Planning describes a practical part of Petroleum Geology for Non-Geoscientists. 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 petroleum geology for non-geoscientists: work planning. 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 petroleum geology for non-geoscientists: work planning 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 petroleum geology for non-geoscientists: work planning: 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 petroleum geology for non-geoscientists: work planning: 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 6: Petroleum Geology for Non-Geoscientists: Data and Performance

Learning objectives

- Explain petroleum geology for non-geoscientists: data and performance, interpret a case, select appropriate controls and justify a documented decision.

Lessons

1. Purpose and key terms of Petroleum Geology for Non-Geoscientists: Data and Performance
2. Systems and operating context
3. Evidence, assumptions and decision gates
4. Hazards, safeguards and escalation
5. Applied case: Petroleum Geology for Non-Geoscientists

Detailed teaching notes

Teaching notes

Core explanation. Petroleum Geology for Non-Geoscientists: Data and Performance describes a practical part of Petroleum Geology for Non-Geoscientists. 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 petroleum geology for non-geoscientists: 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 petroleum geology for non-geoscientists: 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 petroleum geology for non-geoscientists: 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 petroleum geology for non-geoscientists: 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: Petroleum Geology for Non-Geoscientists: Applied Case

Learning objectives

- Explain petroleum geology for non-geoscientists: applied case, interpret a case, select appropriate controls and justify a documented decision.

Lessons

1. Purpose and key terms of Petroleum Geology for Non-Geoscientists: Applied Case
2. Systems and operating context
3. Evidence, assumptions and decision gates
4. Hazards, safeguards and escalation
5. Applied case: Petroleum Geology for Non-Geoscientists

Detailed teaching notes

Teaching notes

Core explanation. Petroleum Geology for Non-Geoscientists: Applied Case describes a practical part of Petroleum Geology for Non-Geoscientists. 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 petroleum geology for non-geoscientists: 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 petroleum geology for non-geoscientists: 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 petroleum geology for non-geoscientists: 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 petroleum geology for non-geoscientists: 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: Petroleum Geology for Non-Geoscientists: Communication and Es

Learning objectives

- Explain petroleum geology for non-geoscientists: communication and escalation, interpret a case, select appropriate controls and justify a documented decision.

Lessons

1. Purpose and key terms of Petroleum Geology for Non-Geoscientists: Communication and Escalation
2. Systems and operating context
3. Evidence, assumptions and decision gates
4. Hazards, safeguards and escalation
5. Applied case: Petroleum Geology for Non-Geoscientists

Detailed teaching notes

Teaching notes

Core explanation. Petroleum Geology for Non-Geoscientists: Communication and Escalation describes a practical part of Petroleum Geology for Non-Geoscientists. 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 petroleum geology for non-geoscientists: 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 petroleum geology for non-geoscientists: 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 petroleum geology for non-geoscientists: 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 petroleum geology for non-geoscientists: 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: Petroleum Geology for Non-Geoscientists: Knowledge Check

Learning objectives

- Explain petroleum geology for non-geoscientists: knowledge check, interpret a case, select appropriate controls and justify a documented decision.

Lessons

1. Purpose and key terms of Petroleum Geology for Non-Geoscientists: Knowledge Check
2. Systems and operating context
3. Evidence, assumptions and decision gates
4. Hazards, safeguards and escalation
5. Applied case: Petroleum Geology for Non-Geoscientists

Detailed teaching notes

Teaching notes

Core explanation. Petroleum Geology for Non-Geoscientists: Knowledge Check describes a practical part of Petroleum Geology for Non-Geoscientists. 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 petroleum geology for non-geoscientists: 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 petroleum geology for non-geoscientists: 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 petroleum geology for non-geoscientists: 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 petroleum geology for non-geoscientists: 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: Petroleum Geology for Non-Geoscientists: Competence Review

Learning objectives

- Explain petroleum geology for non-geoscientists: competence review, interpret a case, select appropriate controls and justify a documented decision.

Lessons

1. Purpose and key terms of Petroleum Geology for Non-Geoscientists: Competence Review
2. Systems and operating context
3. Evidence, assumptions and decision gates
4. Hazards, safeguards and escalation
5. Applied case: Petroleum Geology for Non-Geoscientists

Detailed teaching notes

Teaching notes

Core explanation. Petroleum Geology for Non-Geoscientists: Competence Review describes a practical part of Petroleum Geology for Non-Geoscientists. 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 petroleum geology for non-geoscientists: 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 petroleum geology for non-geoscientists: 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 petroleum geology for non-geoscientists: 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 petroleum geology for non-geoscientists: 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.