

Oil and Gas Production I / Foundations of Energy YAG

Semester 1: Oil and Gas Production I | Semester 2: Foundations of Energy | Double-Blocked | 36 Weeks

Course Structure: Each one-credit course is completed in one 18-week semester through double-block scheduling. OGP 1: = §127.352 Oil and Gas Production I; FE = §127.351 Foundations of Energy. CTE Employability Skills §127.15(d)(1) are integrated throughout both courses. Foundations of Energy includes laboratory and field investigations for at least 40% of instructional time. ACCESS may support career exploration, employability, credential research, and postsecondary planning.

GP	Wks	Unit & Focus	Major Learning Tasks & Assessments	Integrated TEKS	Extension Activities
1	1–2	Unit 1 – Petroleum Industry, Careers & Safety	- Survey petroleum history, industry sectors and career pathways - Apply workplace professionalism, teamwork, communication and problem solving - Identify occupational hazards, PPE, first-aid expectations and environmental responsibilities - Research major petroleum-industry safety/regulatory organizations	- OGP 1: 1(A), 3(A–B) - CTE ES: §127.15(d)(1)	- ACCESS: energy careers - Safety credential research - Industry professional speaker
1	3–5	Unit 2 – Drilling Operations & Technologies	- Trace petroleum drilling history in the U.S. and abroad - Compare routine, offshore and emerging drilling operations - Examine directional-drilling tools and techniques - Differentiate fishing, retrieving and repairing pipe - Use diagrams/models to communicate drilling-system understanding	- OGP 1: 1(A–D) - CTE ES: §127.15(d)(1)	- Drilling timeline - Directional-drilling model - Rig-system diagram
1	6–9	Unit 3 – Well Completion, Pressure & Flow	- Describe methods and activities used to complete a well - Assess fluid pressure and explain how flow is initiated - Identify major well components and explain purpose/design/operation - Examine completion equipment, logging and testing techniques - Analyze factors associated with poorly producing wells and well-service roles	- OGP 1: 1(E–M) - CTE ES: §127.15(d)(1)	- Completion sequence project - Pressure/flow application lab - Well-service career profile
2	10–12	Unit 4 – Production Systems & Wellhead Equipment	- Identify major oil/gas production systems and equipment - Trace process flow through production systems - Identify wellhead components that control fluid flow - Compare wellhead construction and onshore/offshore facilities - Connect wellhead operation to downstream production systems	- OGP 1: 2(A–J) - CTE ES: §127.15(d)(1)	- Production-flow schematic - Wellhead component lab - Facility comparison
2	13–15	Unit 5 – Well Monitoring, Maintenance & Troubleshooting	- Describe monitoring and regulation of well flow - Explain wellhead maintenance performed by production technicians - Operate/troubleshoot a simulated or tabletop wellhead system - Identify conditions requiring manual/automatic shut-in - Practice safe shut-in decision making through scenarios	- OGP 1: 2(K–N), 3(A) - CTE ES: §127.15(d)(1)	- Wellhead simulator - Maintenance checklist - Shut-in scenario lab
2	16–17	Unit 6 – Production Safety & Industry Readiness	- Integrate safety, health and environmental concerns across drilling, production and maintenance - Compare petroleum safety standards and responsible agencies/organizations - Apply professional behaviors to simulated production tasks - Synthesize drilling, completion, production and safety systems in a capstone problem	- OGP 1: 1–3 - CTE ES: §127.15(d)(1)	- Safety audit - Industry-readiness portfolio - Integrated production challenge
2	18	Oil and Gas Production I Semester Exam	- Cumulative written/performance assessment - Drilling-to-production systems application - Safety and troubleshooting performance task	- Cumulative: OGP 1: 1–3 - CTE ES: §127.15(d)(1)	Targeted remediation/enrichment

3	19-20	FE Unit 1 – Energy Careers, Scientific Practices & Laboratory Safety	- Evaluate energy systems and related careers - Examine market/employment trends and future energy needs - Research education, credentials and entrepreneurship opportunities - Apply safe, ethical and environmentally appropriate lab/field practices - Use energy-industry tools, data and technology in hands-on investigations	- FE1(A-E), FE2(A-D), FE11(A-C) - CTE ES: §127.15(d)(1)	- ACCESS: career/credential planning - Energy professional outreach - Lab safety practicum
3	21-23	FE Unit 2 – Energy Forms, Transformations & Conservation	- Identify purposes and forms of energy - Investigate potential, kinetic, chemical, mechanical, electrical and light energy - Analyze gravity, work and energy transformations - Calculate work, potential energy and kinetic energy - Apply conservation of energy and basic calorimetry	- FE3(A-D), FE4(A-B), FE5(A-G) - CTE ES: §127.15(d)(1)	- Energy transformation labs - Calorimetry investigation - Energy-data presentation
3	24-25	FE Unit 3 – Fluid Mechanics & Subsurface Energy Resources	- Identify fluids used as fuels and in energy discovery/production/transportation - Investigate capillary action, pressure and temperature relationships - Analyze geology of underground energy storage - Determine porosity/permeability relationships - Examine aquifers and innovations including hydraulic fracturing	- FE2(A-D), FE6(A-D), FE8(A-D) - CTE ES: §127.15(d)(1)	- Porosity/permeability lab - Fluid-pressure investigation - Texas aquifer/resource mapping
3	26-27	FE Unit 4 – Texas Energy Resources, Production & Economics	- Map major Texas energy resources and power-production locations - Research Texas energy history and economic importance - Analyze technology, conservation, supply and demand - Compare Texas energy patterns with national/global data - Present conclusions using energy data and research	- FE3(A-D), FE4(A-B), FE7(A-H) - CTE ES: §127.15(d)(1)	- Texas energy map - Supply/demand data lab - Energy-economy briefing
4	28-31	FE Unit 5 – Renewable & Non-Renewable Energy Systems	- Identify renewable and non-renewable resources - Compare efficiency of oil, natural gas, coal, nuclear, solar, geothermal, hydroelectric and wind - Investigate benefits, hazards and hazard-reduction strategies - Evaluate availability, cost, pollution, habitat impact and sustainability - Analyze how social perspectives influence energy decisions	- FE2(A-D), FE3(A-D), FE9(A-G) - CTE ES: §127.15(d)(1)	- Energy-source efficiency labs - Resource comparison project - Evidence-based energy debate
4	32-35	FE Unit 6 – Energy, Society, Environment & Future Solutions	- Analyze environmental, ethical and social issues surrounding energy resources - Evaluate long-term energy use and connections to quality of life - Trace production, transmission, processing and marketing - Analyze U.S./global measures related to greenhouse gases, water/air quality and life expectancy - Synthesize career, scientific, economic and societal learning in a final energy-systems project	- FE1-11 - CTE ES: §127.15(d)(1)	- Energy systems capstone - Community/industry presentation - ACCESS: postsecondary pathway update
4	36	Foundations of Energy Semester Exam & Showcase	- Cumulative written/performance assessment - Laboratory/data-analysis application - Final energy-systems presentation and reflection	- Cumulative: FE1-11 - CTE ES: §127.15(d)(1)	Stakeholder showcase

TEKS Coverage Checklist

Semester 1 – Oil and Gas Production I

Strand	Student Expectations	YAG Placement	Coverage
OGP 1: 1	A–M	Units 1–3, 6	100%
OGP 1: 2	A–N	Units 4–6	100%
OGP 1: 3	A–B	Units 1, 5–6	100%

Semester 2 – Foundations of Energy

Strand	Student Expectations	YAG Placement	Coverage
FE1	A–E	Units 1, 6	100%
FE2	A–D	Units 1, 3, 5–6	100%
FE3	A–D	Units 2, 4–6	100%
FE4	A–B	Units 2, 4, 6	100%
FE5	A–G	Units 2, 6	100%
FE6	A–D	Units 3, 6	100%
FE7	A–H	Units 4, 6	100%
FE8	A–D	Units 3, 6	100%
FE9	A–G	Units 5–6	100%
FE10	A–F	Unit 6	100%
FE11	A–C	Units 1, 6	100%

Implementation Notes

- Oil and Gas Production I is completed during Semester 1 in a double-block schedule; Foundations of Energy is completed during Semester 2 in a double-block schedule. Each course earns one credit.
- Foundations of Energy must include laboratory and field investigations for at least 40% of instructional time using safe practices.
- CTE Employability Skills §127.15(d)(1) are integrated throughout both courses through communication, collaboration, professionalism, problem solving, safety, technology use, career exploration, and workplace readiness.
- Weeks 18 and 36 are reserved for cumulative semester exams. No instructional unit crosses the semester boundary, and no calendar-specific dates are included.