

Practicum in Energy – Oil and Gas Emphasis YAG

Two Credits | Full Year | Double-Blocked | 36 Weeks (4 Grading Periods)

Course Structure: Practicum in Energy (PEIMS N1303910) is a work-based learning course recommended for Grades 11–12. Practicum experiences may be paid or unpaid and may occur in laboratory or workplace settings. This YAG emphasizes oil and gas exploration and production while addressing all Practicum in Energy essential knowledge and skills. ACCESS may support career exploration, employability, credential research, postsecondary planning, and professional portfolio development.

GP	Wks	Unit & Focus	Major Learning Tasks & Assessments	Integrated EKS	Extension Activities
1	1–2	Unit 1 – Practicum Launch, Professionalism & SMART Goals	- Establish paid/unpaid laboratory or work-based practicum expectations - Create SMART goals and an individual training/work plan - Practice oral/written field communication, professionalism and time management - Establish work logs, supervisor feedback and professional portfolio procedures - Review applicable rules, laws and workplace expectations	• PE1(A–H)	- ACCESS: career/credential planning - Training plan - Professional portfolio launch
1	3–5	Unit 2 – Leadership, Teamwork & Field Communication	- Analyze leadership characteristics: trust, attitude, integrity and responsibility - Apply teamwork, consensus, continuous improvement, adaptability and conflict resolution - Build effective working relationships and practice cooperative negotiation - Demonstrate respect for diverse coworkers and stakeholders - Apply communication and teamwork during simulated/actual oilfield tasks	• PE1(B–E), PE2(A–H)	- Crew-lead rotation - Toolbox-talk presentation - Supervisor/mentor feedback
1	6–9	Unit 3 – Oilfield Safety, JSA & HSE Systems	- Select and use appropriate PPE - Follow company/industry general and task-specific safety procedures - Complete job safety analyses and identify critical hazards - Practice near-miss reporting and emergency-response roles/actions - Apply OSHA expectations and HSE plan-do-assess-adjust processes - Examine industrial hygiene and hazardous-material exposure controls	• PE1(F), PE3(A–H), PE4 industrial hygiene	- JSA portfolio - Emergency-response drill - Safety professional/industry visit
2	10–12	Unit 4 – Energy Balance, Work, Power & Thermodynamics	- Apply work-energy theorem and conservation of energy/momentum - Investigate kinetic/potential energy transformations - Calculate mechanical energy, power, impulse and momentum - Apply conservation principles in one-dimensional systems - Explain laws of thermodynamics and thermal-energy transfer using oil/gas examples - Apply energy-balance principles to open/closed fluid circuits and heat-cycle efficiency	• PE4(A–E), PE5 energy-balance application	- Pump/compressor energy lab - Heat-transfer investigation - Production efficiency analysis
2	13–15	Unit 5 – Oil & Gas Regulation, Landowner Rights & Environmental Stewardship	- Explain OSHA's regulatory role in the energy industry - Analyze Railroad Commission of Texas and TCEQ roles - Examine environmental standards and responsible field practices - Analyze eminent domain, royalty payments and landowner rights - Explain ERCOT's role in power regulation/distribution and connect energy sectors - Apply regulatory requirements to oil/gas workplace scenarios	• PE5(A–E)	- Lease/royalty case study - Regulatory agency briefing - Environmental compliance scenario

2	16-17	Unit 6 – Upstream Wellsite Systems & Operations	- Analyze drilling performance and performance planning - Explain wellsite logistics management - Examine wellbore integrity during drilling - Analyze unconventional shale operations - Plan mobilization/demobilization and rig-move site preparation - Integrate safety, teamwork and work-based documentation	• PE6(A–E), PE1–3	- Rig-move planning exercise - Wellsite logistics map - Industry mentor review
2	18	Semester 1 Exam – Practicum in Energy	- Cumulative written/performance assessment - Safety/JSA and regulatory application - Oilfield energy-balance and wellsite operations performance task - Portfolio progress review	• Cumulative: PE1–6	• Targeted remediation/enrichment
3	19-21	Unit 7 – Upstream, Midstream & Downstream Oil and Gas Systems	- Define and illustrate upstream operations - Define and illustrate midstream operations - Define and illustrate downstream operations - Trace oil/gas transportation, distribution and logistics systems - Analyze how products, information and responsibilities move across sectors - Connect practicum/worksites activities to the full value chain	• PE7(A–D), PE1–2	- Permian Basin value-chain map - Pipeline/logistics case - Field/virtual site tour
3	22-24	Unit 8 – Digital Technology, Networking & Field Data	- Use business application platforms and professional file-management practices - Apply networking, network navigation and basic programming concepts - Use digital tools to document work, analyze field information and communicate - Organize electronic logs, reports and project records - Apply technology to an oil/gas operations problem	• PE8(A–B), PE1(B,G)	- Digital field log - Data-management project - Operations technology demonstration
3	25-27	Unit 9 – Electrical, Motors, Engines & Oilfield Equipment Technology	- Identify basic electrical-system and circuit components used in industry - Apply Ohm's Law and critical electricity/electronics principles - Examine small-engine repair and diesel technology basics - Compare internal-combustion engines and electrical motors - Connect electrical/mechanical technology to pumps, rigs, production and field equipment - Apply safe work practices during equipment investigations	• PE8(C–E), PE3	- Ohm's Law/electrical lab - Motor/engine comparison - Equipment systems investigation
4	28-30	Unit 10 – Energy Careers & Workforce Readiness	- Research energy occupations by education level from high-school diploma through graduate degree - Research upstream, midstream and downstream employment opportunities - Analyze regional oil/gas labor-market information - Update resume, credentials, work samples and practicum documentation - Practice interview, networking and professional presentation skills	• PE9(A–B), PE1(A–H), PE2	- ACCESS: resume/career tools - Mock interview - Industry career panel
4	31-33	Unit 11 – Petroleum Business, Markets & Project Economics	- Demonstrate business acumen in an oil/gas context - Analyze the energy-industry market and market trends - Apply financial skills to energy project management - Evaluate operational/business decisions using cost and market information - Develop the foundation for a small oil/gas or natural-resource business plan	• PE10(A–D), PE1(G–H)	- Market trend briefing - Project-budget exercise - Entrepreneur interview

4	34–35	Unit 12 – Oil & Gas Business Plan, Practicum Capstone & Portfolio	• Create a strategic prospective business plan for a small oil/gas or natural-resource business • Synthesize safety, regulation, wellsite operations, value chain, technology and business learning • Document practicum/work-based accomplishments and supervisor/mentor feedback • Finalize professional portfolio and career transition plan • Present capstone recommendations to an industry/stakeholder audience	• PE10(E), PE1–10	• Business-plan pitch • Industry review panel • ACCESS: postsecondary transition
4	36	Semester 2 Exam & Practicum Showcase	• Cumulative written/performance assessment • Final work-based learning/technical application • Professional portfolio and capstone evaluation • Reflection on workforce/postsecondary readiness	• Cumulative: PE1–10	• Stakeholder showcase and recognition

Practicum in Energy Essential Knowledge and Skills Coverage Checklist

Strand	Student Expectations	YAG Placement	Coverage
PE1	A-H	Units 1-3, 6-8, 10-12	100%
PE2	A-H	Units 2-3, 6-7, 10-12	100%
PE3	A-H	Units 3, 6, 9, 12	100%
PE4	A-E + industrial hygiene	Units 3-4, 12	100%
PE5	A-E + energy-balance application	Units 4-5, 12	100%
PE6	A-E	Units 6, 12	100%
PE7	A-D	Units 7, 12	100%
PE8	A-E	Units 8-9, 12	100%
PE9	A-B	Units 10, 12	100%
PE10	A-E	Units 11-12	100%

Oil and Gas Emphasis

The practicum context prioritizes oil and gas exploration and production, wellsite logistics, drilling and shale operations, upstream/midstream/downstream systems, pipelines and transportation, oilfield electrical/mechanical technology, petroleum regulation, environmental stewardship, landowner/royalty issues, petroleum markets, and oil/gas entrepreneurship while maintaining full coverage of the statewide Practicum in Energy standards.

Implementation Notes

- Practicum in Energy is a two-credit, full-year course recommended for Grades 11–12 and is scheduled here as a double-block course.
- Work-based learning may occur in paid or unpaid arrangements and in settings appropriate to the student's needs. When direct placement is not available, laboratory, simulated-industry, mentor-supported, and project-based experiences should preserve the work-based application required by the course.
- Recommended course activities include industry visits, resume development, use of regional labor-market information, research into energy transportation/distribution/logistics, and a training plan among the employer, student, and district.
- Weeks 18 and 36 are reserved for cumulative semester exams. No instructional unit crosses the semester boundary, and no calendar-specific dates are included.