

# ENERGY (ENER)

## ENER 1510 Foundations of Oil, Gas, and Well Plugging Operations 3 s.h.

Overview of the historical development, terminology, and operational framework of the oil and gas industry. Topics include the history of drilling and production in the United States and the Appalachian Basin, oilfield terminology, well construction and production processes, orphaned and abandoned well problem, and plugging and abandonment operations.

## ENER 1511 Safety, Health, and Environmental Protection in Field Operations 2 s.h.

This course introduces principles of safety and hazard recognition in well plugging and abandonment operations. Topics include wellsite hazards, hydrogen sulfide awareness, fire safety, emergency response, basic first aid concepts, and workplace safety practices. Emphasis is placed on risk identification, prevention, and regulatory compliance in field environments.

## ENER 1511L Safety, Health, and Environmental Protection in Field Operations Lab 1 s.h.

This course prepares students to recognize and respond to hazards encountered in P&A field operations. Topics include well site hazard recognition, hydrogen sulfide safety at awareness and field/supervisory levels, fire extinguisher use, basic first aid and CPR, drug-free workplace policy, off-road and back-road driving skills required for access to well sites in rural and rugged terrain. Instructor permission required.

**Prereq. or Coreq.:** C or better in ENER 1511.

## ENER 2610 Technical Aspects of Well Plugging and Abandonment 3 s.h.

Technical foundation for plugging program design and execution. Topics include well integrity and barrier philosophy; surface casing vent flow (SCVF) and gas migration; federal and state regulatory requirements; oilwell cement properties, additives, and volume calculations; vault-and-vent systems; plugging across lost circulation zones; historic and unknown-construction wells; urban and infrastructure-adjacent plugging; Class II injection well abandonment; and introduction to project-level plugging design decisions.

**Prereq. or Coreq.:** C or better in ENER 1510.

## ENER 2611 Field Operations I 2 s.h.

Rig-based and rig-less plugging and abandonment (P&A) field operations with emphasis on mechanical skills and rig floor practice. Topics include workover rig types and components, rig-less abandonment methods and decision criteria, oil country tubular goods, API rigging and lifting standards, and well control fundamentals at the awareness level.

**Prereq. or Coreq.:** C or better in ENER 1510.

## ENER 2611L Field Operations I Lab 2 s.h.

Rig-based and rig-less plugging and abandonment (P&A) field operations with emphasis on mechanical skills and rig floor practice. Laboratory sessions provide hands-on instruction in hand tools, floor hand basics, rig moves and rigging up, and cutting, milling, fishing, and well cleanout operations. Instructor permission required.

**Prereq. or Coreq.:** C or better in ENER 2611.

## ENER 2612 Field Operations II 2 s.h.

Overview of the wireline and cementing operations. Topics include cased-hole wireline operations, cement bond log (CBL) interpretation, explosives handling, perforating and pipe cutting, and working under pressure with lubricators and snubbing equipment.

**Prereq. or Coreq.:** C or better in ENER 1510.

## ENER 2612L Field Operations II Lab 2 s.h.

Overview of the wireline and cementing operations. Topics include cased-hole wireline operations, cement bond log (CBL) interpretation, explosives handling, perforating and pipe cutting, and working under pressure with lubricators and snubbing equipment. Laboratory sessions address applied cementing operations, special cementing problems in well plugging, and gas sampling techniques used to verify plug integrity and assess residual wellbore gas.

**Prereq. or Coreq.:** ENER 2612.

## ENER 2613 Heavy Equipment, Auxiliary Services, and Reclamation 2 s.h.

Overview of heavy equipment, trucking, skilled trades, and reclamation activities supporting plugging and abandonment (P&A) operations from site mobilization through final restoration. Topics include oilfield trucking operations, vac truck and winch truck applications, roustabout and equipment operator roles, tank battery and production facility decommissioning, and well site reclamation and remediation.

**Prereq. or Coreq.:** C or better in ENER 1510.

## ENER 2613L Heavy Equipment, Auxiliary Services, and Reclamation Lab 2 s.h.

Overview of heavy equipment, trucking, skilled trades, and reclamation activities supporting plugging and abandonment (P&A) operations from site mobilization through final restoration. Laboratory sessions provide orientation-level instruction in loader, excavator, and bulldozer operations and hands-on practice in oilfield pipefitting and welding and cutting as applied to P&A work. Instructor permission required.

**Prereq. or Coreq.:** C or better in ENER 2613.

## ENER 2614 Operations Management and Supervision 3 s.h.

Overview of supervisory and administrative roles in plugging and abandonment operations. Topics include multi-state regulatory frameworks; plugging permits and reports; leases, titles, rights-of-way, and Road Use Maintenance Agreement; master service agreements and insurance requirements; prevailing wage and federal and state contract accounting; plugging economics and time-versus-cost decision-making; field crew supervision; simultaneous operations management; field communications and reporting; and accident investigation and conflict resolution.

**Prereq.:** C or better in ENER 1510.

**Prereq. or Coreq.:** C or better in ENER 2610.

## ENER 2619 Applied Capstone in Well Plugging Operations 2 s.h.

Integration of knowledge and skills developed across the certificate through applied case studies and a supervised field simulation exercise. Topics include finding wells from records and field techniques, fishing for lost tools, naturally occurring radioactive material (NORM) and technologically enhanced naturally occurring radioactive material (T-NORM) awareness, streams and wetlands considerations, Upper Appalachian region ecology, plugging near roadways, securing well sites and protecting neighboring properties, and emerging applications in carbon capture, utilization, and storage (CCUS).

**Prereq.:** C or better in ENER 1510 and ENER 1511 and ENER 2610.

**Prereq. or Coreq.:** C or better in ENER 2611L and ENER 2612L and ENER 2613L and ENER 2614.