NCEES
advancing licensure for engineers and surveyors

NCEES Principles and Practice of Engineering Examination
PETROLEUM CBT Exam Specifications

Effective beginning October 1, 2023

- The PE Petroleum exam is computer-based. It is closed book with an electronic reference.
- Examinees have 9.5 hours to complete the exam, which contains 85 questions. The 9.5-hour time includes a tutorial and an optional scheduled break. Examinee works all questions.
- The exam uses both the International System of units (SI) and the U.S. Customary System (USCS).
- The exam is developed with questions that will require a variety of approaches and methodologies, including design, analysis, and application.
- The knowledge areas within each exam topic are not exclusive or exhaustive categories.

	Number of Questions
1. Drilling	**17–26**

A. Casing and tubulars (e.g., collapse, burst, tensile strength, grade, connections, combined loads, barrier management)

B. Cementing (e.g., properties, yield, placement, downhole equipment, testing protocols)

C. Drilling fluids (e.g., rheology, chemistry, oil-base/water-base, density, hydrostatics calculations, pore pressure, leakoff, fracture gradients, solids control equipment, processing and removal)

D. Drill string and BHA (e.g., available weight, overpull, equipment, location in string, tubular movement, fishing equipment and techniques)

E. Drilling mechanics (e.g., rock properties, drill-off test, torque and drag, wellbore stability, drilling performance techniques)

F. Hydraulics (e.g., pressure drops, fluid velocities, ECD, mud pump performance)

G. Rig equipment capabilities (e.g., equipment, pressure ratings, size and configuration for land, fixed and floater)

H. Directional/horizontal drilling (e.g., motors, calculations, steering, TVD/MD, horizontal displacement, vertical section)

I. Wellheads (e.g., equipment, pressure ratings, size and configuration for surface and subsea)

J. Well control/blowout preventer (e.g., kick tolerance, well kill methods, equipment, trip margins, swab and surge pressures for surface, subsea, and all phases for the life of the well)

K. Bits (e.g., classification, cutting structures, grading, ROP, nozzle size and velocity, jet impact, hydraulic horsepower, coring)

L. Managed pressure/underbalanced drilling (e.g., candidate selection, air, foam, equipment, rotating blowout preventers)

2. Production/Completion **18–27**

A. Lift mechanism selection, design, and operation (e.g., sucker rod pumping systems, gas lift, plunger lift, ESPs, jet pumps, progressive cavity pumps)
B. Perforating (e.g., size, density, tools, methods, phasing)
C. Completion and workover fluids (e.g., density, compatibility, quality and characteristics)
D. Well and completion systems, including completion tubing and downhole equipment (e.g., zonal isolation, tubular force analysis, packers)
E. Nodal analysis, including inflow/outflow performance curve analysis and mechanical skin identification (individual well and manifolded systems)
F. Production logging (e.g., pressure surveys, fluid profiles, cased-hole logs)
G. Abandonment (e.g., plug placement, barriers, casing cutting and pulling)
H. Remedial/recompletion operations (e.g., squeeze cementing, sand and water control, fishing, wireline)
I. Coiled tubing and snubbing operations
J. Enhanced recovery (e.g., pressure maintenance, miscible injection, water floods, thermal recovery, geothermal)
K. Production chemistry/fluid compatibility (e.g., scale, asphaltenes, paraffins, corrosion, hydrates, produced water)
L. Well stimulation methods (e.g., fracture treatments, matrix acid treatments)
M. Rock mechanics, including properties and stability
N. Production and injection allocation of all fluid streams

3. Facilities **9–14**

A. Hydraulics analysis (e.g., piping systems, gathering systems, gas, liquid, multiphase)
B. Compressor/pump application and sizing parameters
C. Onsite processing and storage equipment sizing, selection, and troubleshooting (e.g., separators, heaters, treaters)
D. Custody transfer metering devices for oil, gas, and water (e.g., orifice meters, LACT, samplers)
E. U.S. codes and standards associated with facility design and construction (e.g., API, ASME, OSHA, ANSI, FERC, DOT, PHMSA)
F. Relief and safety system sizing, selection, and installation (e.g., relief scenarios, pressure vessels, process equipment protection, piping system protection, storage equipment effects)
G. Materials selection and production chemistry (e.g., corrosion inhibition and treating, corrosion monitoring, scale, asphaltenes, paraffins, hydrates, solids)
H. Regulatory and environmental support (e.g., emission control and quantification, gas dispersion analysis)
I. Gas, oil, water, steam treating, conditioning, transporting, and processing (e.g., dehydration, amine sweetening, acid gas treatment, scavenging, dew point control, injectant quality)

4. Reservoirs **17–26**

A. Volumetric calculations (e.g., OOIP, OGIP, fluid contacts, aquifers)

B. Material balance (e.g., hydrocarbons in place, water influx, P/z, drive mechanisms)

C. Decline curve analysis (e.g., rate-time, rate-cum, ratio plots)

D. Well testing (e.g., pressure transient, rate transient, type curve, interference testing, wireline, drillstem test)

E. Geologic impacts (e.g., mapping, stratigraphic and lithologic effects, faulting, boundaries)

F. Unconventional reservoirs (e.g., shale, coal beds, oil/tar sands, ultralow permeability)

G. Waterflooding and enhanced recovery (e.g., sweep efficiency, pattern geometry, project selection, pressure maintenance)

H. Reservoir simulation (e.g., model geometry, model formulation, history matching, model selection)

I. Drive mechanisms (e.g., identification, production profiles, recovery factors)

J. Fluid properties and identification (e.g., bubble point, dewpoint, viscosity, compressibility, composition, critical properties)

K. Rock properties and formation evaluation (e.g., porosity, permeability, compressibility, relative permeability, stress orientation, log selection and interpretation, lithology)

5. Economics and Management **9–14**

A. Project management (e.g., QA/QC, budgeting, scheduling, risk assessment, regulatory framework)

B. Petroleum ownership and economics (e.g., cash flows, royalty burdens, interest, capital and operating expenses, financial metrics, probability analysis)