NCEES
advancing licensure for engineers and surveyors

NCEES Principles and Practice of Surveying (PS) Examination
Exam Specifications

Effective Beginning July 2027

- The PS exam is computer-based. It is closed book with an electronic reference.
- Examinees have 7 hours to complete the exam, which contains 100 questions. The 7-hour time also includes a tutorial and an optional scheduled break.
- The exam uses the U.S. Customary System (USCS) of units.
- The exam is developed with questions that will require a variety of approaches and methodologies, including design, analysis, and application.

		Number of Questions
1.	**Professional Survey Practices**	**20–30**

A. Research public/private record sources
   1. Resources for private and public records (e.g., deeds, plats, GIS data, imagery)
   2. Local public records indexing and filing system
   3. Local private survey office records
   4. How to interpret, evaluate, and analyze all available records

B. Provide clear communication for the supervision and responsibility of field procedures to ensure timely and complete data collection by field staff
   1. Field surveying procedures
   2. Local field surveying practices
   3. Data collection protocols
   4. How to utilize data collection protocols
   5. How to communicate project-specific instructions

C. Utilize applicable surveying methods to map geodetic positions to datums, projections, and coordinate systems
   1. Space segment (e.g., various satellite constellations, frequencies, ephemeris)
   2. Static GNSS, RTK, PPP, virtual networks, post processing, and baselines
   3. Remote sensing technology (e.g., LiDAR)
   4. How to select and operate appropriate instruments
   5. How to resolve field issues related to GPS positioning (e.g., multipath, atmospheric)
   6. How to plan, collect, download, process, adjust, and QA/QC observations

D. Apply surveying principles and computations to determine solutions and final documentation
   1. Technical computations
   2. Applicable software
   3. Computer-aided drafting (CAD) software
   4. How to select the appropriate adjustment method
   5. How to ensure QA/QC procedures

E. Identify land development solutions to prepare land use plans for client implementation
   1. Regulatory land development requirements
   2. Land development implementation procedures
F. Prepare survey deliverables depicting the results of data acquired for use by the client
   1. Technical communications by schematic, platting, and mapping processes and procedures
   2. Communication options
G. Utilize GIS in terms of compilation and the uses of mapping and metadata
   1. GIS spatial databases (e.g., data layers and attributes) and metadata
   2. Datums and projections related to GIS

2. Standards and Specifications 11–17

A. Understand the ALTA/NSPS land title surveys requirements for owners, lenders, and title companies
   1. Inconsistencies between ALTA/NSPS Land Title Surveys and jurisdiction statutes and local regulations
   2. Interpret and apply legal documents (e.g., deeds, easements, and agreements)
   3. Zoning information
   4. Title insurance documents
   5. How to recognize surface evidence of features (e.g., subsurface and overhead)
B. Apply FEMA requirements to determine or validate existing conditions relative to published floodplain guidelines
   1. FEMA specifications and instructions
   2. Horizontal and vertical datums related to FEMA flood zones
   3. FEMA Elevation Certificate, LOMRs, and LOMAs
   4. FEMA Flood Insurance Study
   5. How to validate authoritative vertical datums related to FEMA flood zones
   6. How to determine authoritative Base Flood Elevations
   7. How to interpret a FEMA Flood Insurance Study
C. Apply NGS standards for horizontal and vertical control
   1. Leveling standards
   2. Methods to collect the data for OPUS post-processing standards
   3. How to achieve leveling classification according to NGS standards
   4. How to plan a static session utilizing an OPUS solution
D. Apply the National Map Accuracy Standards (NMAS) and the Federal Geographic Data Committee (FGDC) standards
   1. How to calculate data to meet the acceptable percentile
E. Identify the appropriate monumentation standards for compliance when setting monuments
   1. Applicable monumentation criteria
   2. Monument types
   3. How to apply the appropriate monumentation standards

3. Business Practices 6–9

A. Perform general business practices and procedures to discern the client's needs and your capabilities to provide an effective and efficient service
   1. Project planning and project management
   2. Deliverables (e.g., sketch, reports, descriptions, map)
   3. Proposals, budgets, and contracts
   4. Types of surveys
   5. Site features and conditions
   6. Scope of services
   7. How to determine and use appropriate equipment
   8. How to correlate costs with the scope of work and identify scope issues

B. Determine and implement risk management procedures to limit liability and protect the public
   1. Safety procedures
   2. QA/QC methods
   3. Risk management in contracts
   4. Insurance needs and requirements
   5. How to recognize and practice within areas of expertise
   6. Potential liabilities
   7. Consequences of certifying survey documents

C. Conduct business in a manner to maintain professional integrity utilizing accepted industry standards of practice
   1. Ethics/conflict of interest
   2. How to set company standards to reduce risk liabilities
   3. How to evaluate staff skills and abilities

D. Practice effective oral and written communication with clients, staff, related professionals, and the public
   1. Appropriate types of communication to convey concepts
   2. Related professions and their impact on client needs and deliverables
   3. How to conduct yourself and communicate professionally with the public and clients (e.g., right of entry)

4. Areas of Practice/Types of Surveys 10–15

A. Establish, densify, and tie into control networks and geodetic network surveys relative to datums, projections, and coordinate systems
   1. Ellipsoids, datums, projections, and coordinate systems
   2. How to differentiate between local datums, geodetic datums, coordinate systems, grid vs. ground, and relationships thereof
   3. Vertical datums
   4. Local control network standards of accuracy
   5. How to calculate and field verify control networks
   6. Ellipsoid height, geoid models, and orthometric heights
   7. Combined Scale Factor

B. Perform construction layout surveys for the designed infrastructure relative to the plan and/or specifications
   1. How to interpret and incorporate plans for construction layout
   2. Construction calculations (e.g., slopes/grades, plan details)

3. Horizontal and vertical positioning relative to a plan or datum (e.g., identifying benchmarks, coordinate system)
4. How to interpret various 2D and 3D plan sets
5. Construction procedures and activities
6. Appropriate equipment to achieve project specific tolerances
7. Site specific protocols and safety standards
8. QA/QC of work products

C. Perform corridor surveys and alignments for roads, utilities, and other linear features
1. Alignment stationing practices
2. How to read and interpret record drawings
3. How to reconcile data relative to original projects/surveys
4. How to re-establish original alignments
5. Project planning

D. Perform as-built surveys to document positions and elevations of new and/or original infrastructure for compliance and future reference
1. As-built/record drawing calculations (e.g., slopes/grades, plan details)
2. How to implement techniques and activities for as-built/record drawings
3. Horizontal and vertical as-built/record drawing positions relative to the appropriate plan or datum
4. QA/QC of work products
5. How to discern applicable project specific standards
6. Appropriate equipment to achieve project specific tolerances

E. Perform topographic surveys utilizing appropriate methodologies
1. Site topography (e.g., breaklines, surface points, slope, contouring)
2. Planimetrics, improvements, and other surface features
3. Underground features (e.g., utilities, tanks, cemeteries)
4. Volumetrics
5. Cross-sections and profiles
6. How to identify and collect topographic features
7. TINs, DEMs, DTMs, and DSMs
8. Tools and techniques for site specific accuracy standards (e.g., UAS, Robotics, GPS, scanning, LiDAR)
9. Hydrographic/bathymetric surveys

F. Understand the implications and elements of boundary surveying
1. Identify and evaluate physical boundary evidence (e.g., lines of possession/occupation, natural and artificial monuments)
2. Historical measurement accuracy, equipment, units of measurement, and techniques
3. Various land grant systems and/or cadastral systems (e.g., PLSS, metes-and-bounds, prior land grants)
4. Quality of various parcel data sources (e.g., GIS grade vs. survey grade)
5. Subdivisions (e.g., lot-and-block, estate, political)

5. Legal Principles 23–35

A. Understand legal principles as applied to survey evidence
1. Current common law and statutory law principles
2. Parol evidence

3. Unwritten rights (e.g., adverse possession, acquiescence, estoppel)
4. Dignity of calls in land surveying
5. Controlling elements of a survey (e.g., calls for monuments, adjoiners)
6. "Follow in the footsteps" doctrine
7. How to analyze key components of common law boundary principles and apply them to the final product

B. Understand common and statutory law for the purpose of identifying boundary locations and property interests
1. Riparian and littoral rights
2. Sovereign rights (e.g., navigable waters, eminent domain)
3. Sovereign land grants

C. Understand legal principles of sequential and simultaneous conveyances for the purpose of determining boundary locations and property interests
1. Types of conveyances
2. Junior/senior rights
3. Record and physical evidence
4. How to research historical records
5. How to analyze record and physical data
6. How to apply appropriate legal principles

D. Understand legal descriptions for real property transactions to document boundary locations and property interests
1. Types of documents that are used in the transfer of real property
2. How to interpret legal descriptions
3. Controlling elements and how they impact the description
4. Unwritten rights and how they impact the description
5. Encumbrances and how they impact the description
6. How to identify and evaluate ambiguities and discrepancies

E. Understand easements, servitudes, and rights of way
1. Easement classifications (e.g., easement in gross, easement appurtenant)
2. Rights of way types (e.g., public, private)
3. Unmappable rights (e.g., timber, solar, light, aerial)
4. Prescriptive rights
5. Easement descriptions (e.g., blanket, corridor)
6. Differences in easements and rights of way

6. Areas of Practice/Types of Surveys (Boundary Division) 15–23

A. Perform surveys to retrace existing land parcel boundaries by analyzing records and field data and applying legal principles
1. How to research available resources and records
2. How to search for physical evidence of boundaries
3. Parol and other sources of evidence
4. How to interpret deeds and other evidence
5. How to identify physical boundary evidence
6. Boundary reconciliation
7. Perpetuation of survey
8. Historical measurement accuracy, equipment, and techniques

B. Perform surveys to establish new parcels, lots, and units
    1. Types of subdivisions
    2. Platting
    3. Condominiums and other common interest developments
    4. Deed restrictions and restrictive covenants
    5. Zoning and subdivision ordinances
    6. Party walls
C. Perform surveys to retrace or establish easements and rights of way
    1. How to search for physical evidence for easements
    2. Types of easements
    3. How to reconcile evidence with records
    4. Termination of rights (e.g., reversion, abandonment, release)
    5. Creation and abandonment of railroads, roads, and highways
    6. Recovery of rights of way and easement baselines
D. Prepare legal descriptions
    1. Format of legal descriptions
    2. Types of legal descriptions (e.g., lot-and-block, metes-and-bounds)
E. Perform surveys to determine littoral and riparian rights and boundaries
    1. Erosion, accretion, reliction, and avulsion
    2. Tidal waters
    3. How to determine upland ownership
    4. Rights to non-tidal waters (e.g., perpendicular, colonial, proportional)
F. Perform ALTA/NSPS land title surveys
    1. ALTA/NSPS minimum standards
    2. Table A optional items
    3. Relative positional precision
    4. Certification

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NCEES Principles and Practice of Surveying (PS) Examination Standards

Effective beginning July 2027

In addition to the NCEES *PS Reference Handbook*, the following standards will be supplied on the exam as searchable, electronic pdf files with links for easy navigation. This NCEES YouTube video shows how standards will be presented on the exam. Standards will be provided as individual documents on the exam, and only one document at a time can be opened and searched. This ensures the exam software runs large files effectively. The handbook and standards will be available the entire exam.

Solutions to exam questions that reference a standard of practice are scored based on this list and the revision year shown. Solutions based on other standards will not receive credit.

NCEES does not sell standards or printed copies of the NCEES handbook. The NCEES handbook is accessible from your MyNCEES account.

ABBREVIATION	STANDARD TITLE
ALTA	*Minimum Standard Detail Requirements for ALTA/NSPS Land Title Surveys,* 2026, American Land Title Association®, Washington, DC, and National Society of Professional Surveyors, Frederick, MD, www.nsps.us.com.
FEMA	*FEMA Elevation Certificate and Instructions*, 2023, Federal Emergency Management Agency, Hyattsville, MD, www.fema.gov.
FGCS	Section 3.5 Geodetic Leveling in *FGCS Specifications and Procedures to Incorporate Electronic Digital/Bar-Code Leveling Systems*, 2004, Federal Geographic Data Committee, Reston, VA, www.fgdc.gov.
GPAS	*Geospatial Positioning Accuracy Standards*, Federal Geographic Data Committee, Reston, VA, www.fgdc.gov. • Parts 1–3, 1998 • Part 4, 2002 • Part 5, 2005
USNMAS	*United States National Map Accuracy Standards*, 1947, U.S. Bureau of the Budget, Washington, DC, www.usgs.gov.