Introduction

ABOUT THIS BOOK

*Principles and Practice of Surveying Practice Exam* includes a practice exam designed to match the specifications and format of the NCEES PS exam. The practice exam contains 100 problems designed to help familiarize you with the exam’s knowledge areas, as well as to evaluate your level of exam preparedness. If you can comfortably pass this practice exam, you should be well-prepared to take the actual exam.

ABOUT THE PRINCIPLES AND PRACTICE OF SURVEYING (PS) EXAM

In most of the United States, requirements for registration as a surveyor include passing the National Council of Examiners for Engineering and Surveying (NCEES) Fundamentals of Surveying (FS) exam and the Principles and Practice of Surveying (PS) Exam. Once you have passed the FS exam, you generally must complete a minimum of four years’ work experience under the supervision of a registered surveyor before you may take the PS exam. (Check with your state’s licensing board to determine exact requirements.)

Effective January 2019, the PS exam is a computer-based exam. The exam is closed book, except for an NCEES-supplied electronic reference that will be provided to you at the exam. The test is a 7-hour, 100-problem exam. The 7 hours includes 2 minutes for completion of a non-disclosure agreement, 8 minutes for a tutorial, 25 minutes for an optional scheduled break, and 5 hours, 20 minutes for actually taking the exam (not counting using some or all of the break). You may take additional breaks beyond the scheduled break if you raise your hand first, but any such breaks will count against the 5 hours and 20 minutes allotted for taking the exam.

The general format of the problems in the exam continues to be the traditional multiple-choice exam with a problem statement followed by four answer options. However, the computer-based exam may also include alternate item type (AIT) problems, such as fill-in-the-blank problems, point-and-click (on points on a graphic) problems, and drag-and-drop problems for ranking or labeling items.

Your exam may include a limited number of problems, known as pre-test items, that will not be scored and will not have an impact on your grade. NCEES does this to determine the viability of new problems for future exams. There is no way to know which problems are pre-test items. They are not identifiable and are randomly distributed throughout the exam.

Your exam score is based on the number of problems you answer correctly. No credit is deducted for wrong answers, so it is in your best interest to answer each problem. A committee of subject matter experts works with psychometricians to determine the level of performance that corresponds with minimal competence in the discipline. Statistical equating is used to ensure that this level of performance is consistent across multiple administrations of the exam.

The PS exam covers five knowledge areas. Those areas, their subtopics, and the number of problems to expect in each knowledge area are as shown.

1. **Legal Principles (18–27 Problems)**
   
   (A) Principles of Evidence
   
   1. How to search for data and for physical evidence to evaluate data
   2. How to evaluate data
   3. Parol evidence
   4. Prescriptive rights
   5. Adverse possession
   6. Acquiescence
   7. Controlling elements
   8. Easement rights

   (B) Common Law Boundary Principles
   
   1. Historical and current common law principles
   2. Riparian and littoral rights
   3. Sovereign rights, including both navigable waters and eminent domain
   4. Sovereign land grants
(C) Sequential and Simultaneous Conveyance Concepts
   1. Types of conveyances
   2. Junior/senior rights
   3. Record and physical evidence

(D) Legal Descriptions for Real Property Transactions
   1. Preparation and interpretation of legal descriptions
   2. Controlling elements and how they impact the description
   3. Unwritten rights and how they impact the description
   4. Encumbrances and how they impact the description
   5. Easements and how they impact the description

(E) Evidence for the Perpetuation of the U.S. PLSS

2. Professional Survey Practices (22–33 Problems)
   (A) Public/private record sources
      1. Resources for private and public records
      2. Local public records indexing and filing system
      3. Local survey office records
   (B) Documentation, Supervision, and Clear Communication of Field Procedures
      1. Field surveying techniques
      2. Field surveying practices
      3. Data collection protocols
   (C) GPS/GNSS including satellite constellations, static GPS, RTK, PPP, and virtual networks
   (D) Surveying Principles and Computations
      1. Technical computations
      2. Applicable software
   (E) Monumentation Standards
      1. Applicable monumentation criteria
      2. Monument types
   (F) Land Development Solutions
      1. Regulatory land development criteria
      2. Construction criteria
      3. Land development implementation procedures
   (G) Survey Maps/Plats/Reports
      1. Technical communications by schematic, platting, and mapping processes and procedures
      2. Communication options
   (H) GIS
      1. GIS spatial databases and metadata
      2. Datums and projections related to GIS

3. Standards and Specifications (8–12 Problems)
   (A) BLM Manual of Surveying Instructions
   (B) American Land Title Association/National Society of Professional Surveyors (ALTA/NSPS) Land Title Survey Standards
      1. Current ALTA/NSPS Land Title Survey Standards
      2. State statutes regarding boundary surveys in conjunction with ALTA/NSPS Land Title Surveys
   (C) FEMA Requirements
      1. FEMA specifications and instructions
      2. Horizontal and vertical datums related to FEMA flood zones
      3. Current FEMA elevation certificate
      4. FEMA Flood Insurance Study

   (A) General Business Practices and Procedures
      1. Project planning and project management
      2. Deliverables
      3. Costs, budgets, and contracts
      4. Types of surveys
      5. Site features and conditions
6. Scope of services
7. Appropriate equipment and instruments

(B) Risk Management Procedures
1. Safety procedures
2. QA/QC methods
3. Risk management in contracts
4. Insurance needs and requirements
5. Potential liabilities

(C) Professional Conduct

(D) Communication with Clients, Staff, Related Professions, and the Public
1. Different forms of communications
2. Appropriate type of communication to convey concepts
3. Related professions and their impact on client needs and deliverables

5. Areas of Practice (24–36 Problems)

(A) ALTA/NSPS Land Title Surveys
1. Legal documents, such as deeds, easements, and agreements
2. Zoning information as applied to ALTA/NSPS Land Title Surveys
3. Title insurance commitment letters and policies
4. Underground features as applied to ALTA/NSPS Land Title Surveys

(B) Control Networks and Geodetic Network Surveys
1. Datums and reference frames relative to control networks
2. Differences between local datums and geodetic datums
3. Equipment appropriate for control surveys
4. The Federal Geographic Data Committee Geospatial Positioning Accuracy Standards
5. The National Geospatial Programs (NGP) Standards and Specifications—Digital Data Standards

(C) Construction Surveys
1. Construction plan reading
2. Construction calculations, including slopes, grades, and plan details
3. Construction techniques and activities
4. Horizontal and vertical positioning relative to a plan or datum

(D) Boundary Surveys
1. Physical boundary evidence
2. Boundary reconciliations
3. Historical measurement accuracy, equipment, and techniques
4. Legal principles related to boundary surveys

(E) Route Surveys for Alignments and Utilities
1. Route alignment stationing practices
2. Reading and interpreting roadway and utility plans

(F) Topographic
1. Topographic/planimetric mapping and control standards
2. Interpretation, reconciliation, and adjustment of topographic survey data
3. QA/QC procedures as applied to topographic surveys
4. Ground, hydrographic, and remote sensing equipment
5. The U.S. National Map Accuracy Standards as applied to topographic surveys
6. Tools and techniques required to perform hydrographic, bathymetric, and remote sensing surveys
7. Nomenclature related to utilities

(G) Surveys to Establish New Parcels, Lots, or Units
1. Types of subdivisions
2. Platting
3. Condominiums and associations
4. Deed restrictions and restrictive covenants
5. Zoning and subdivision ordinances

(H) As-Built/Record Drawing Surveys
1. As-built/record drawing calculations including slopes, grades, and plan details
2. As-built/record drawing techniques and activities
3. Horizontal and vertical as-built/record drawing positions relative to a plan or datum

(I) Consultation Services
1. Site topography and slope for development purposes
2. Site access for development purposes
3. Zoning standards related to new projects
4. Floodplains as related to land development

RECOMMENDED REFERENCE MATERIAL

As previously stated, the exam is closed book, so you will not be able to take any reference material into the exam, although the NCEES PS Reference Handbook (NCEES Handbook) will be provided at the exam. Before the exam, PPI’s Surveyor Reference Manual will help you in preparing, as will the following references, which offer comprehensive coverage of the exam’s knowledge areas. Edition numbers have been omitted since new editions are often issued. Use the most recent edition available.

Legal Principles


Measurement and Computational Theory and Practice (Including Geodesy & GPS)


Geographic Information Systems and Photogrammetry

Land Development


Business Law, Management, Economics, and Finance


CALCULATORS

Only specific types of calculators are allowed while taking the PS exam. For more information on the currently allowed models, see ppi2pass.com/calculators.

HOW TO USE THIS BOOK

For best results, treat the practice exam in this book as you would your actual exam. Do not read the problems ahead of time, and do not look at the solutions until you have finished the exam.

Taking the practice exam in this book under the same time constraints and with the same reference material as the actual exam will help you assess your level of
preparedness. Therefore, you should use a timer and allow a total of 5 hours and 20 minutes to take the exam. After 50 problems, it is recommended that you take a break of 25 minutes (which does not count towards the 5 hour 20 minute limit).

Before beginning this practice exam, read the instructions (which simulate the ones you will receive at the actual exam). For this practice exam, mark your answers on the provided answer sheets. Use the PS Reference Handbook, available from the NCEES website, as your only reference for solving these problems. Once you have completed the exam, check your answers using the answer keys. Make note of those areas you did well in and of those requiring further study. Review the step-by-step solutions to learn appropriate solving methods. If you have time, consider taking the practice exam again after reviewing your weaker areas. The keys to success on the exam are to know the basics and to practice solving as many problems as possible. This book will help you with both objectives.