

**FUNDAMENTALS OF SURVEYING (FS)
 CBT EXAM SPECIFICATIONS**

Effective Beginning with the January 2014 Examinations

- The FS exam is a computer-based test (CBT). It is closed book with an electronic reference.
- Examinees have 6 hours to complete the FS exam, which contains 110 questions. The 6-hour time also includes a tutorial and a break.
- The FS exam uses the US Customary System (USCS) of units.

Knowledge	Number of Questions
1. Mathematics	13–20
A. Algebra, trigonometry, and basic geometry	
B. Spherical trigonometry	
C. Linear algebra and matrix theory	
D. Analytic geometry and calculus	
2. Basic Sciences	5–8
A. Geology	
B. Dendrology	
C. Cartography	
D. Environmental sciences	
3. Spatial Data Acquisition and Reduction	6–9
A. Vertical measurement	
B. Distance measurement	
C. Angle measurement	
D. Unit conversions	
E. Redundancy	
F. Knowledge and utilization of instruments and methods	
G. Understanding of historical methods and instruments	
4. Survey Computations and Computer Applications	19–29
A. Coordinate geometry	
B. Traverse closure and adjustment	
C. Area	
D. Volume	
E. Horizontal curves	
F. Vertical curves	
G. Spirals	
H. Spreadsheets	
5. Statistics and Adjustments	6–9
A. Mean, median, mode	
B. Variance, standard deviation	
C. Error analysis	
D. Least squares adjustment	
E. Measurement and positional tolerance	
F. Relative, network, and positional accuracy	

6. Geodesy	5–8
A. Basic theory	
B. Satellite positioning	
C. Gravity	
D. Coordinate systems	
E. Datums	
F. Map projections	
7. Boundary and Cadastral Survey Law	13–20
A. Controlling elements	
B. Gathering and identifying evidence	
C. Records research	
D. Legal descriptions	
E. Case law	
F. Riparian rights	
G. Public land survey system	
H. Metes and bounds	
I. Simultaneously created parcels	
J. Easements and encumbrances	
8. Photogrammetry and Remote Sensing	4–6
A. Interpretation and analysis	
B. Project and flight planning	
C. Quality control	
D. Ground control	
E. LiDAR	
9. Survey Processes and Methods	11–17
A. Land development—principles, standards, and regulations	
B. Boundary location	
C. Mapping, cartography, and topography	
D. Construction	
E. Riparian surveys	
F. Route surveying	
G. Control surveys	
10. Geographic Information Systems (GIS)	5–8
A. Feature collection and integration	
B. Database concepts and design	
C. Accuracy and use	
D. Metadata	
11. Graphical Communication and Mapping	6–9
A. Plans and specifications	
B. Contours and slopes	
C. Scales	
D. Planimetric features and symbols	
E. Land forms	
F. Digital terrain modeling and digital elevation modeling	
G. Survey maps, plats, drawings, and reports	

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| 12. Professional Communication | 4–6 |
| A. Oral | |
| B. Written | |
| C. Alternate forms of communication | |
| D. Documentation and recordkeeping | |
| 13. Business Concepts | 3–5 |
| A. Contracts | |
| B. Liability and risk management | |
| C. Financial practices | |
| D. Leadership and management principles | |
| E. Personnel management principles | |
| F. Project planning and design | |
| G. Ethics | |
| H. Safety | |