

1. Record Nr.	UNINA9910151651303321
Autore	Ghilani Charles D
Titolo	Elementary Surveying : International Edition
Pubbl/distr/stampa	, : Pearson Education UK, , 2013 ©2011
ISBN	1-4479-3045-2
Edizione	[13th ed.]
Descrizione fisica	1 online resource (983 pages)
Altri autori (Persone)	WolfPaul R
Soggetti	Surveying Geomatics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Cover -- Table of Contents -- PREFACE -- What's New in This Edition? -- Acknowledgments -- 1 INTRODUCTION -- 1.1 Definition of Surveying -- 1.2 Geomatics -- 1.3 History of Surveying -- 1.4 Geodetic and Plane Surveys -- 1.5 Importance of Surveying -- 1.6 Specialized Types of Surveys -- 1.7 Surveying Safety -- 1.8 Land and Geographic Information Systems -- 1.9 Federal Surveying and Mapping Agencies -- 1.10 The Surveying Profession -- 1.11 Professional Surveying Organizations -- 1.12 Surveying on the Internet -- 1.13 Future Challenges in Surveying -- Problems -- Bibliography -- 2 UNITS, SIGNIFICANT FIGURES, AND FIELD NOTES -- PART I: UNITS AND SIGNIFICANT FIGURES -- 2.1 Introduction -- 2.2 Units of Measurement -- 2.3 International System of Units (SI) -- 2.4 Significant Figures -- 2.5 Rounding Off Numbers -- PART II: FIELD NOTES -- 2.6 Field Notes -- 2.7 General Requirements of Handwritten Field Notes -- 2.8 Types of Field Books -- 2.9 Kinds of Notes -- 2.10 Arrangements of Notes -- 2.11 Suggestions for Recording Notes -- 2.12 Introduction to Data Collectors -- 2.13 Transfer of Files from Data Collectors -- 2.14 Digital Data File Management -- 2.15 Advantages and Disadvantages of Data Collectors -- Problems -- Bibliography -- 3 THEORY OF ERRORS IN OBSERVATIONS -- 3.1 Introduction -- 3.2 Direct and Indirect Observations -- 3.3 Errors in Measurements -- 3.4 Mistakes -- 3.5 Sources of Errors in Making Observations -- 3.6 Types of Errors -- 3.7

Precision and Accuracy -- 3.8 Eliminating Mistakes and Systematic Errors -- 3.9 Probability -- 3.10 Most Probable Value -- 3.11 Residuals -- 3.12 Occurrence of Random Errors -- 3.13 General Laws of Probability -- 3.14 Measures of Precision -- 3.15 Interpretation of Standard Deviation -- 3.16 The 50, 90, and 95 Percent Errors -- 3.17 Error Propagation -- 3.18 Applications. 3.19 Conditional Adjustment of Observations -- 3.20 Weights of Observations -- 3.21 Least-Squares Adjustment -- 3.22 Using Software -- Problems -- Bibliography -- 4 LEVELING-THEORY, METHODS, AND EQUIPMENT -- PART I: LEVELING-THEORY AND METHODS -- 4.1 Introduction -- 4.2 Definitions -- 4.3 North American Vertical Datum -- 4.4 Curvature and Refraction -- 4.5 Methods for Determining Differences in Elevation -- PART II: EQUIPMENT FOR DIFFERENTIAL LEVELING -- 4.6 Categories of Levels -- 4.7 Telescopes -- 4.8 Level Vials -- 4.9 Tilting Levels -- 4.10 Automatic Levels -- 4.11 Digital Levels -- 4.12 Tripods -- 4.13 Hand Level -- 4.14 Level Rods -- 4.15 Testing and Adjusting Levels -- Problems -- Bibliography -- 5 LEVELING-FIELD PROCEDURES AND COMPUTATIONS -- 5.1 Introduction -- 5.2 Carrying and Setting Up a Level -- 5.3 Duties of a Rodperson -- 5.4 Differential Leveling -- 5.5 Precision -- 5.6 Adjustments of Simple Level Circuits -- 5.7 Reciprocal Leveling -- 5.8 Three-Wire Leveling -- 5.9 Profile Leveling -- 5.10 Grid, Cross-Section, or Borrow-Pit Leveling -- 5.11 Use of the Hand Level -- 5.12 Sources of Error in Leveling -- 5.13 Mistakes -- 5.14 Reducing Errors and Eliminating Mistakes -- 5.15 Using Software -- Problems -- Bibliography -- 6 DISTANCE MEASUREMENT -- PART I: METHODS FOR MEASURING DISTANCES -- 6.1 Introduction -- 6.2 Summary of Methods for Making Linear Measurements -- 6.3 Pacing -- 6.4 Odometer Readings -- 6.5 Optical Rangefinders -- 6.6 Tacheometry -- 6.7 Subtense Bar -- PART II: DISTANCE MEASUREMENTS BY TAPING -- 6.8 Introduction to Taping -- 6.9 Taping Equipment and Accessories -- 6.10 Care of Taping Equipment -- 6.11 Taping on Level Ground -- 6.12 Horizontal Measurements on Sloping Ground -- 6.13 Slope Measurements -- 6.14 Sources of Error in Taping -- 6.15 Tape Problems -- 6.16 Combined Corrections in a Taping Problem. PART III: ELECTRONIC DISTANCE MEASUREMENT -- 6.17 Introduction -- 6.18 Propagation of Electromagnetic Energy -- 6.19 Principles of Electronic Distance Measurement -- 6.20 Electro-Optical Instruments -- 6.21 Total Station Instruments -- 6.22 EDM Instruments Without Reflectors -- 6.23 Computing Horizontal Lengths from Slope Distances -- 6.24 Errors in Electronic Distance Measurement -- 6.25 Using Software -- Problems -- Bibliography -- 7 ANGLES, AZIMUTHS, AND BEARINGS -- 7.1 Introduction -- 7.2 Units of Angle Measurement -- 7.3 Kinds of Horizontal Angles -- 7.4 Direction of a Line -- 7.5 Azimuths -- 7.6 Bearings -- 7.7 Comparison of Azimuths and Bearings -- 7.8 Computing Azimuths -- 7.9 Computing Bearings -- 7.10 The Compass and the Earth's Magnetic Field -- 7.11 Magnetic Declination -- 7.12 Variations in Magnetic Declination -- 7.13 Software for Determining Magnetic Declination -- 7.14 Local Attraction -- 7.15 Typical Magnetic Declination Problems -- 7.16 Mistakes -- Problems -- Bibliography -- 8 TOTAL STATION INSTRUMENTS -- ANGLE OBSERVATIONS -- PART I: TOTAL STATION INSTRUMENTS -- 8.1 Introduction -- 8.2 Characteristics of Total Station Instruments -- 8.3 Functions Performed by Total Station Instruments -- 8.4 Parts of a Total Station Instrument -- 8.5 Handling and Setting Up a Total Station Instrument -- 8.6 Servo-Driven and Remotely Operated Total Station Instruments -- PART II: ANGLE OBSERVATIONS -- 8.7 Relationship of Angles and Distances -- 8.8 Observing Horizontal Angles with Total

Station Instruments -- 8.9 Observing Horizontal Angles by the Direction Method -- 8.10 Closing the Horizon -- 8.11 Observing Deflection Angles -- 8.12 Observing Azimuths -- 8.13 Observing Vertical Angles -- 8.14 Sights and Marks -- 8.15 Prolonging a Straight Line -- 8.16 Balancing-In -- 8.17 Random Traverse. 8.18 Total Stations for Determining Elevation Differences -- 8.19 Adjustment of Total Station Instruments and Their Accessories -- 8.20 Sources of Error in Total Station Work -- 8.21 Propagation of Random Errors in Angle Observations -- 8.22 Mistakes -- Problems -- Bibliography -- 9 TRAVERSING -- 9.1 Introduction -- 9.2 Observation of Traverse Angles or Directions -- 9.3 Observation of Traverse Lengths -- 9.4 Selection of Traverse Stations -- 9.5 Referencing Traverse Stations -- 9.6 Traverse Field Notes -- 9.7 Angle Misclosure -- 9.8 Traversing with Total Station Instruments -- 9.9 Radial Traversing -- 9.10 Sources of Error in Traversing -- 9.11 Mistakes in Traversing -- Problems -- 10 TRAVERSE COMPUTATIONS -- 10.1 Introduction -- 10.2 Balancing Angles -- 10.3 Computation of Preliminary Azimuths or Bearings -- 10.4 Departures and Latitudes -- 10.5 Departure and Latitude Closure Conditions -- 10.6 Traverse Linear Misclosure and Relative Precision -- 10.7 Traverse Adjustment -- 10.8 Rectangular Coordinates -- 10.9 Alternative Methods for Making Traverse Computations -- 10.10 Inversing -- 10.11 Computing Final Adjusted Traverse Lengths and Directions -- 10.12 Coordinate Computations in Boundary Surveys -- 10.13 Use of Open Traverses -- 10.14 State Plane Coordinate Systems -- 10.15 Traverse Computations Using Computers -- 10.16 Locating Blunders in Traverse Observations -- 10.17 Mistakes in Traverse Computations -- Problems -- Bibliography -- 11 COORDINATE GEOMETRY IN SURVEYING CALCULATIONS -- 11.1 Introduction -- 11.2 Coordinate Forms of Equations for Lines and Circles -- 11.3 Perpendicular Distance from a Point to a Line -- 11.4 Intersection of Two Lines, Both Having Known Directions -- 11.5 Intersection of a Line with a Circle -- 11.6 Intersection of Two Circles -- 11.7 Three-Point Resection -- 11.8 Two-Dimensional Conformal Coordinate Transformation. 11.9 Inaccessible Point Problem -- 11.10 Three-Dimensional Two-Point Resection -- 11.11 Software -- Problems -- Bibliography -- 12 AREA -- 12.1 Introduction -- 12.2 Methods of Measuring Area -- 12.3 Area by Division into Simple Figures -- 12.4 Area by Offsets from Straight Lines -- 12.5 Area by Coordinates -- 12.6 Area by Double-Meridian Distance Method -- 12.7 Area of Parcels with Circular Boundaries -- 12.8 Partitioning of Lands -- 12.9 Area by Measurements from Maps -- 12.10 Software -- 12.11 Sources of Error in Determining Areas -- 12.12 Mistakes in Determining Areas -- Problems -- Bibliography -- 13 GLOBAL NAVIGATION SATELLITE SYSTEMS-INTRODUCTION AND PRINCIPLES OF OPERATION -- 13.1 Introduction -- 13.2 Overview of GPS -- 13.3 The GPS Signal -- 13.4 Reference Coordinate Systems -- 13.5 Fundamentals of Satellite Positioning -- 13.6 Errors in Observations -- 13.7 Differential Positioning -- 13.8 Kinematic Methods -- 13.9 Relative Positioning -- 13.10 Other Satellite Navigation Systems -- 13.11 The Future -- Problems -- Bibliography -- 14 GLOBAL NAVIGATION SATELLITE SYSTEMS-STATIC SURVEYS -- 14.1 Introduction -- 14.2 Field Procedures in Satellite Surveys -- 14.3 Planning Satellite Surveys -- 14.4 Performing Static Surveys -- 14.5 Data Processing and Analysis -- 14.6 Sources of Errors in Satellite Surveys -- 14.7 Mistakes in Satellite Surveys -- Problems -- Bibliography -- 15 GLOBAL NAVIGATION SATELLITE SYSTEMS-KINEMATIC SURVEYS -- 15.1 Introduction -- 15.2 Planning of Kinematic Surveys -- 15.3 Initialization -- 15.4 Equipment

Used in Kinematic Surveys -- 15.5 Methods Used in Kinematic Surveys
-- 15.6 Performing Post Processed Kinematic Surveys -- 15.7
Communication in Real-Time Kinematic Surveys -- 15.8 Real-Time
Networks -- 15.9 Performing Real-Time Kinematic Surveys -- 15.10
Machine Control -- 15.11 Errors in Kinematic Surveys.
15.12 Mistakes in Kinematic Surveys.

Sommario/riassunto

For Surveying courses offered in Civil Engineering departments. This highly readable, best-selling text presents basic concepts and practical material in each of the areas fundamental to modern surveying (geomatics) practice. Its depth and breadth are ideal for self-study. The 13th Edition is updated throughout to reflect the latest advances and technology.
