

GOVERNMENT OF THE PUNJAB

**TECHNICAL EDUCATION & VOCATIONAL
TRAINING AUTHORITY**



CURRICULUM FOR

CIVIL SURVEYOR

(6 – Month Course)

Revised April 2016

**CURRICULUM SECTION
ACADEMICS DEPARTMENT**

96-H, GULBERG-II, LAHORE

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TRAINING OBJECTIVES

Civil Engineering has a vital role in execution of civil works for the development. The subject of land surveying has prime importance in civil industry i.e. construction of buildings, roads, bridges, airports, drains, sewer lines, water supplies, canal, dams, docks & harbors, railway lines, oil & gas pipe lines, and urban / rural development projects.

Keeping in view the local & public sectors this curriculum is designed / developed to accelerate the surveying skills in order to produce skilful & capable workforce to meet the job market.

CURRICULUM SALIENTS

Entry-level	:	Matric
Duration of course	:	06 - Months
Total Training Hours	:	800 Contact Hours
Training Methodology	:	Practical. 80%
	:	Theory 20%
Medium of Instruction	:	Urdu / English

KNOWLEDGE PROFICIENCY DETAILS

On successful completion of this course, the trainee should be able to: -

1. Explain the surveying, object of survey and work of a surveyor.
2. Explain the principles, Classification and primary Division of Survey.
3. Define the source of errors and checking technique of surveying instruments.
4. Define the temporary adjustment technique of instruments.
5. Describe the measurements (Linear & Angular)
6. Express the chain Surveying
7. Express the tackling of problems in Various Surveying Techniques.
8. Explain the use of all small/handy surveying instruments.
9. Explain the compass survey.
10. Define the solution of problems in compass survey.
11. Describe the method of plane table survey.
12. Describe the levelling and leveling terms
13. Describe the levelling Instruments.
14. Describe the temporary adjustment of level.
15. Describe the principles of levelling
16. Explain the reduction of levels.
17. Explain the classification of levelling.
18. Explain the computation of earthwork.
19. Explain the contouring.
20. Define the theodolite survey by traversing and triangulation.
21. Express the designing and setting out of simple/circular, transition composes and vertical curves.
22. Express the horizontal and vertical and slop distance by tachometer.
23. Describe the equipment and procedure Photogramatery.
24. Define the total station, background and its uses.
25. Describe the operations of total station and booking the fields notes.
26. Explain the oral and writing improvement in communication skill.

SKILL PROFICIENCY DETAILS

On successful completion of this course, the trainee should be able to: -

1. Read the linear and angular measurements.
2. Unfold/fold and read the engineer's & metric chains.
3. Chain a line.
4. Measure a survey field with chain or tape.
5. Range a centre line and measure the offsets with chain or tape.
6. Prepare the survey symbols/conventional signs.
7. Divide the land into triangles.
8. Measure the base and tie lines.
9. Range out the reciprocal survey field.
10. Do the temporary adjustment of levels.
11. Work on tilting, auto set and lasers level.
12. Work in different kinds of levelling i.e.; Differential / Compound / Continuous levelling check levelling Profile/Longitudinal levelling or sectioning, cross-sectioning, reciprocal levelling, precise and trigonometrically levelling and plotting.
13. Locate the contours by different methods.
14. Plot the contours map and road routing in hilly area.
15. Do the temporary adjustment of Theodolite.
16. Work on Conventional, modern and digital Theodolite.
17. Read the horizontal and vertical angles, bearing, traversing.
18. Set out different curves by lines or chain and tape methods and angular or instrumental methods i.e. simple or circular curves, transition curves, and vertical curves, and vertical curves etc. triangulation, tachometry of?
19. Set the total station up for measurement; take the distance offset, horizontal, right and vertical angle and repetition angle measurement.
20. Operate the total station for data collection set occupied and back sight points, set a point, side shot method, resection method, and execute a layout.

SCHEME OF STUDIES
CIVIL SURVEYOR
 (6 – Month Course)

S. No	Main Topics	Theory Hours	Practical Hours	Total Hours
1.	Basic Menstruation	20	30	50
2.	Fundamental of Surveying	6	30	36
3.	Chain Surveying (trilateration)	6	30	36
4.	Compass Surveying	6	30	36
5.	Plane Table Survey	16	54	70
6.	Levelling	26	100	126
7.	Theodolite Surveying	30	120	150
8.	Total Station	26	150	176
9.	I.T Fundamentals	8	32	40
10.	Functional English	16	64	80
Total		160	640	800

DETAIL OF COURSE CONTENTS**Civil Surveyor
(6 – Month Course)**

S. No.	Detail of Topics	Theory Hours	Practical Hours
1.	Basic Menstruation	10	15
	1.1. Measurement System		
	1.1.1. Foot-lb System and Metric System		
	1.1.2. Conversions of Foot lb System to Metric System		
	1.1.3. Multiples and parts of units.		
	1.1.4. Exercise to solve problems regarding conversion, additions, multiplication and division of measurements		
	1.2. Areas		
	1.2.1. Area of rectilinear plane (Square, rectangle, triangle and Rhombus etc.) and Areas of circle, segment, sector etc.		
	1.2.2. Areas and parameter of Composed figures		
	1.2.3. Practice in calculating areas of plane geometrical figures (Rectangle triangle, circle section)		
	1.2.4. Practice in calculating areas of composed plane figures		
	1.2.5. Areas of irregular figures		
	1.2.6. Practice to calculate areas of irregular figure		
	1.2.7. Practice in calculating covered area of building from working drawings	10	15
	1.3. Trigonometry		
	1.3.1. Pythagorean Theorem		

	1.3.2. Trigonometric ratios 1.3.3. Solutions of triangle 1.3.4. Sine Law 1.3.5. Practice in solving problem regarding trigonometric ratio, Pythagorean theorem etc		
2.	Fundamentals of Surveying 2.1. Definition, Role of the Surveyor Tasks of the surveyor. 2.2. Purposes of survey 2.3. Principles of surveying 2.4. Classification of surveyors 2.5. Units & types of measurements & Minor Tool and equipment for 2.5.1. Linear Measurements 2.5.2. Angular measurements 2.6. Scale 2.6.1. Representation of Seale 2.6.2. Types of scale 2.6.3. Selection of scale 2.6.4. Construction of scale. 2.7. Surveying Symbols	6	30
3.	Chain Survey (Trilateration) 3.1. Introduction of Chain Surveying. 3.2. Ranging a line, chaining method 3.3. Study & handling of instruments. 3.4. Requirements for establishing station and Division area into triangles. 3.5. Book keeping of area surveyed 3.6. Problems solving regarding error in chainage and map. 3.7. Measurement of base line & tie lines, position marking of features taking offsets.	6	30

	3.8. Plot of map by trilateration techniques		
4.	Compass Survey 4.1. Introduction of compass survey, terms and equipment used, study and handling of instruments. 4.2. Determination of Whole Circle produced fore and back bearing. 4.3. Traversing with chain and compass. 4.4. Plotting a traverse Survey by included angles & by rectangular co ordinates.	6	30
5.	Plane Table Survey 5.1. Introduction working operation and method of plane surveying. 5.2. Plane tabling by radiations, intersection, traversing & resection method. 5.3. Two & three point problems.	16	54
6.	Levelling 6.1. Introduction and terms used in levelling, types of levels, operational study. 6.2. Permanent & Temporary Adjustment of Level. 6.3. Types of Staves & Reading Taking. 6.4. Types of Bench Mark. 6.5. Data Entry in Level book by HI Method & rise and Fall Method. 6.6. Errors in Book Keeping & Checking Techniques. 6.7. Comparison between different types of Levelling. 6.8. Simple Levelling 6.9. Differential Levelling 6.10. Precise Levelling 6.11. Laser Levelling	26	100

	<p>6.12. Plotting of Profile / Longitudinal Level.</p> <p>6.13. Cross-Section Plotting</p> <p>6.14. Stack the Road and Sewer</p> <p>6.15. Contouring</p> <p>6.15.1. Definition, terms used & types of contouring</p> <p>6.15.2. Characteristics of Contour Lines.</p> <p>6.15.3. Direct & Indirect method of Locating contours.</p> <p>6.15.4. Uses of contour maps for volume calculation and road routing in hilly areas.</p> <p>6.16. Hydrographic Survey</p> <p>6.16.1. Introduction, terms used, instruments required and techniques of surveying.</p>		
7.	<p>Theodolite Surveying</p> <p>7.1. Verniers</p> <p>7.1.1. Verniers and its principles</p> <p>7.1.2. Types of vernier.</p> <p>7.1.3. Computation of best count by principle of vernier</p> <p>7.2. Theodolite (Introduction, Adjustment and Functions)</p> <p>7.2.1. Introduction of Theodolite, of parts, types and uses</p> <p>7.2.2. Permanent Adjustment for Plate level line of collimation, bubble axis, vertical & horizontal axis of telescope</p> <p>7.2.3. Temporary adjustment including centering, levelling and removal of parallax.</p>	30	120

	<p>7.2.4. Measuring Angle vertical, horizontal angles prolong a survey line, lining in measuring heights and distances.</p> <p>7.3. Theodolite Traversing</p> <p>7.3.1. Traversing and its different types.</p> <p>7.3.2. Explain different Methods and steps Involved in traversing.</p> <p>7.3.3. State the standard of accuracy of linear angular measurement.</p> <p>7.3.4. Computation of bearing from angles.</p> <p>7.3.5. Explain the coordinates & its types</p> <p>7.3.6. Compute latitude of departures of lines,</p> <p>7.3.7. Compute coordinates from given fields notes.</p> <p>7.3.8. Methods of plotting.</p> <p>7.3.9. Errors and mistake in Theodolite traversing.</p> <p>7.3.10. Rectification, errors and mistake.</p> <p>7.4. Routing Curves</p> <p>7.4.1. Definition, necessity types, terms used, classification and designation of curves.</p> <p>7.4.2. Computation of Data for setting out simple circular curve.</p> <p>7.4.3. Different method of setting out circular curves.</p> <p>7.4.4. Steps involved in setting out circular curves.</p> <p>7.4.5. Introduction of types and necessity of vertical curves.</p> <p>7.4.6. Computation of data for setting out</p>		
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	<p>vertical curves.</p> <p>7.4.7. Steps involved in setting out vertical curves in field.</p> <p>7.4.8. Types, elements and length of simple, transition and combine curves.</p> <p>7.4.9. Different methods for setting combine curves.</p> <p>7.4.10. Steps involved in setting out combine curve in field.</p> <p>7.4.11. Introduction and computation of formula for super elevation.</p> <p>7.5. Triangulation</p> <p>7.5.1. Introduction and types of triangulation</p> <p>7.5.2. Factors involved in selection station and baseline.</p> <p>7.5.3. Steps in baseline measurement.</p> <p>7.5.4. Nature of correction in baseline measurement.</p> <p>7.5.5. Introduction of Tachometry.</p> <p>7.5.6. Types and quality of equipment required for tachometry.</p> <p>7.5.7. Calculation of inclined, horizontal and vertical distances.</p> <p>7.6. Tunnel Survey</p> <p>7.6.1. Introduction</p> <p>7.6.2. Instruments Required</p> <p>7.6.3. Technique of Tunnel Surveying</p> <p>7.7. Photogramatery</p> <p>7.7.1. Introduction</p> <p>7.7.2. Types and Principles of Photogramatery.</p>		
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	7.7.3. Aerial Survey.		
8.	<p>Total Station</p> <p>8.1. Introduction to Total Station, Comparison with other surveying instruments and setting of equipments.</p> <p>8.2. Selecting Coordinate Data File, Setting out Occupied Point, Setting Back sight Point, Centering and Levelling put station and back station data (Orientation).</p> <p>8.3. Setting Horizontal / Vertical Angle from the Keys and Measurement</p> <p>8.4. Setting of Atmospheric Correction, Correction of Prism Constant, correction for refraction & earth curvature (setting scale factor) and Angle Tilt correction.</p> <p>8.5. Distance Measurement (Continues, N-Time & Single Measurement)</p> <p>8.6. Offset Measurement & Stakeout</p> <p>8.7. Introduction with Special Mode (Menu Mode)</p> <p>8.8. Coordinate Measurement & Remote Elevation Measurement</p> <p>8.9. Area Calculation from Coordinate Data File</p> <p>8.10. Area Calculation from Measured Data</p> <p>8.11. Introduction of PCODE Library and Setting Parameter for Data Collection</p> <p>8.12. Operational Procedure for Data Collection</p> <p>8.13. Execution of Layout and setting a new point by side shot method & resection methods.</p> <p>8.14. Introduction to Memory Manager Mode.</p> <p>8.15. Display Internal Memory Status, Searching Data i.e. Measuring Data Searching,</p>	26	150

	Coordinate Data Searching, PCODE Library Searching. 8.16. File Maintenance i.e. Rename a File, Searching Data in a File and Deleting a File or Coordinate Data from a File 8.17. Editing PCODE Library & Data Communication (Sending / Loading Data) 8.18. Introduction of global positioning system (GPS)		
TOTAL		136	544

LIST OF PRACTICALS

Sr. No.	Name of Practical's
1.	Practice for Mensuration
2.	Practice for Finding areas for different figures
3.	Practice for trigonometry
4.	Practice for linear and angular measurements
5.	Practice for chain survey
6.	Practice for compass survey
7.	Practice for plain table survey
8.	Practice for permanent adjustment of level
9.	Practice for temporary adjustment of level
10.	Practice for taking entries in field book as per rise and fall method and height of instrument method
11.	Practice for simple fly leveling
12.	Practice for check leveling
13.	Practice for differential leveling
14.	Practice for laser leveling
15.	Practice for precise leveling
16.	Practice for cross sectioning
17.	Practice for long sectioning
18.	Practice for contouring of hill road
19.	Practice for Vernier theodolite
20.	Practice for digital theodolite
21.	Practice for permanent adjustment of theodolite
22.	Practice for removing of parallax
23.	Practice for measuring horizontal and vertical angles
24.	Practice for theodolite traversing with different methods
25.	Practice for computation of bearings

26.	Practice to compute latitude of departure for lines
27.	Practice for finding errors during theodolite traversing
28.	Practice to computation data for simple curve
29.	Practice to computation data for compound curve
30.	Practice to computation data for vertical curve
31.	Practice to computation data for transition curve
32.	Practice to computation data for super elevation
33.	Practice for triangulation
34.	Practice for tachometry
35.	Calculation for horizontal, vertical & inclined angles
36.	Selecting co-ordinates data file on Total Station
37.	Selecting orientation on Total Station
38.	Selecting horizontal angles from keys on Total Station
39.	Selecting vertical angles from keys on Total Station
40.	Setting scale factor on Total Station
41.	Setting atmospheric correction on Total Station
42.	Practice for correction of Prism Constant on Total Station
43.	Practice for Distance measurement on Total Station
44.	Offset measurement and stake out on Total Station
45.	Practice for main menu on Total Station
46.	Practice for remote elevation measurement on Total Station
47.	Calculate area from co-ordinate data file on total station
48.	Practice for PCODE library on total station
49.	Practice to setting parameters for data collection on total station
50.	Setting a new point by side shot method
51.	Practice to display internal memory status
52.	Practice to searching data and deleting data
53.	Practice to file maintenance on total station

54.	Practice to rename a file
55.	Practice to communicate / sending data
56.	Practice to G.P.S

SCHEME OF STUDIES**I.T. Fundamentals**

S.No	Main Topics	Theory Hours	Practical Hours	Total Hours
1.	Introduction to Computers	2	6	8
2.	Typing - Microsoft Word	4	14	18
3.	Internet & Electronic Mail	2	12	14
Total		8	32	40

DETAIL OF COURSE CONTENTS
I.T Fundamentals

S. No	Detail of Topics	Theory Hours	Practical Hours
1	<p>Introduction to Computers</p> <p>1.1 What is a computer- Definition, functions and general features?</p> <p>1.2 What is Hardware –</p> <p style="padding-left: 20px;">1.2.1 Computer parts and units</p> <p style="padding-left: 40px;">1.2.1.1 Input Unit - Keyboard, Mouse etc.</p> <p style="padding-left: 40px;">1.2.1.2 Central Processing Unit</p> <p style="padding-left: 40px;">1.2.1.3 Output Unit</p> <p>1.3 What is Software –</p> <p style="padding-left: 20px;">1.3.1 Electronic Parts of a Pc it is</p> <p style="padding-left: 40px;">1.3.1.1 Software and Its types</p> <p style="padding-left: 40px;">1.3.1.2 System Software, Application software and its functions</p> <p>1.4 Working with windows Operating System</p> <p style="padding-left: 20px;">1.4.1 How does windows desktops work?</p> <p style="padding-left: 20px;">1.4.2 Setting desktop, background and wall papers etc.</p> <p style="padding-left: 20px;">1.4.3 Viewing directories – List of files and folders different styles.</p> <p>1.5 What are the Icons, Shortcuts and other graphic,</p> <p style="padding-left: 20px;">1.5.1 How to see computer contents on different drives etc.</p>	2	6
2	<p>Typing and Word processing (MS Word)</p> <p>2.1 Proper way of typing correct and speedy - getting familiar with the keys</p> <p>2.2 Where to type in computer? How to save a file? How to get it back? Where to find your saved work?</p> <p>2.3 Formatting in MS Word Bold, Italic, page setup, setting shades and colors.</p> <p>2.4 Working with saved work, opening and moving files.</p> <p>2.5 How to get it printed?</p>	4	14

3	Emailing and Internet Surfing	2	12
	3.1 How to go to Internet, what is required for an internet connection etc.		
	3.2 How to use email? How to search on web? Etc		
	3.3 How to make new email account, login and logout an email account etc.?		
	3.4 Downloading and uploading attachments etc.		
Total		8	32

LIST OF PRACTICALS
I.T Fundamentals

S. No.	Name of Practical
1.	Turn On/Off and setting of power supply
2.	Accessing The Desktop
3.	Using of Icons and Shortcuts
4.	Setting / customizing the desktop
5.	Viewing the contents of computer – Directory
6.	Setting the view of a folder
7.	Copying, Deleting and Moving Files in a folder
8.	Working with different Applications
9.	Opening MS Word for typing
10.	First lesson of Typing A S D F
11.	Second Lesson of typing J K L ;
12.	Third Lesson U I O P
13.	Fourth Lesson R E W Q
14.	Fifth Lesson N M , .
15.	Sixth Lesson V C X Z
16.	Seventh Lesson All letter using R index Finger
17.	Eighth Lesson All letter using L index Finger
18.	Formatting in MS Word Bold, Italic etc.
19.	Page Setting/ Page Layout
20.	Using Internet
21.	Opening Email, making new account
22.	Sending Receiving Emails
23.	Downloading and uploading attachments etc.

SCHEME OF STUDIES
Functional English

S.No	Main Topics	Theory Hours	Practical Hours	Total Hours
1.	Use of past indefinite tense	2	6	8
2.	Use of 'was' 'were' ' questions and negatives	3	6	8
3.	Explaining a situations/ analysis	2	6	8
4.	Communication in writing	2	6	8
5.	Comprehension	1	6	7
6.	Application/ C.V.	1	6	7
7.	Dialogues	1	9	10
8.	Understand vocabulary	1	3	4
9.	Writing complaints/ answers to complaints	1	9	10
10.	Interviews	2	7	10
Total		16	64	80

DETAIL OF COURSE CONTENTS
Functional English

S. No	Detail of Topics	Theory Hours	Practical Hours
1	Use of past indefinite tense 1.1 Describing past events	2	6
2	Use of ‘was’ ‘were’ ‘ questions and negatives	2	6
3	Explaining a situations/ analysis 3.1 Making a plan 3.2 Visiting factory area 3.3 Giving justifications	2	6
4	Communication in writing 4.1 Asking for list of stationery items 4.2 Submitting report of performance of team of technicians 4.3 Submitting joining report	2	6
5	Comprehension: practice sets	2	6
6	Job application/C.V.	1	6
7	Dialogues	1	9
8	Understand vocabulary	1	3
9	Writing complaints/ answers to complaints	1	9
10	Interviews	2	7
Total		16	64

LIST OF PRACTICALS
Functional English

S. No.	Practical
1.	Group discussion
2.	Interviews
3.	Role play

LIST OF LABS

Civil Surveyor

- Surveying Filed
- Drawing Hall

I.T Fundamentals

- Computer Lab

LIST OF TOOLS / EQUIPMENTS
(For a class of 25 students)

Name of Trade	Civil Surveyor
Duration of Course	6 Months

S. No.	Name of Equipment / Tool	Quantity
1	Metric Chain (30 m)	05 Nos.
2	Engineer's Chain	05
3	Gunter Chain	02
4	Metallic tape (100 ft)	05
5	Steel Tape (100 ft)	05
6	Invar tape (30 m)	01
7	Ranging rods	30
8	Arrows	30
9	Cross Staff	05
10	Optical Square	05
11	Wooden Mallet	05 Nos.
12	Wooden pegs	200 Nos.
13	Abney's Level	05
14	Prismatic Compass with tripod	06
15	Plumb bob	10 Nos.
16	Plane Table Set (u-frame, alidade, through compass, plumb bob and tripod etc.)	05 Nos.
17	Auto Set Level with Stand	05
18	Tilting Level with Stand	05
19	Levelling Staff (metric and foot system)	20
20	Target Staff	05
21	Vernier theodolite with stand	02

22	Microptic Theodolite with Stand	02
23	Total Station with all accessories	02
24	Sounding Rod	05
25	Velocity Rod	05
26	Planimeter	01
27	Work Stations P IV	12
28	Printer	2 Nos.
29	Software (Ms-Office, Auto CAD)	One each

COMPUTER LAB

S. No.	Tools / Equipment	Quantity
1.	Desktop computer (Specifications as per notification issued by MIS Section, TEVTA)	26 (1 for each student & 1 for the teacher)
2.	Printer (Laser)	01
3.	Scanner	01
4.	Internet Connection (At least 1 MB speed)	01
5.	UPS 10 KVA	01
6.	Air Conditioner 1 ½ Ton	02
7.	Multimedia Projector	01

CONSUMABLE MATERIALS**Functional English**

S. No.	Item	Quantity
1.	Stationary	As per requirement
2.	Board Markers	As per requirement

I.T Fundamentals

S. No.	Item	Quantity
1.	Printing Paper	As per requirement
2.	Printer Toner	As per requirement

MINIMUM QUALIFICATION OF TEACHER

- B.Sc. Civil Engineering with 2 Year relevant experience.

OR

- DAE Civil Engineering with 4 Year relevant experience.

OR

- Years proficiency certificate with 6 years related experience

Functional English

- M.A (English)

I.T Fundamentals

- DAE CIT/ BCS from HEC recognized university

EMPLOYABILITY OF THE PASS OUTS

The pass outs of this course can find job / employment opportunities in the following sections / areas: -

1. Govt. Organizations
2. Semi – Government Organizations
3. Private Organization
4. Construction Industry

REFERENCE BOOKS

1. Surveying & Leveling by T.P. Kanetkar
2. Surveying & Leveling by Sh. Muhammad Asif
3. Textbook of Surveying by National Book Foundation

Functional English

1. High School English Grammar By Wren & Martin
2. Oxford English Grammar

I.T Fundamentals

1. Introduction to Computer by Peter Norton
2. 2007 Microsoft® Office System Step by Step by Joyce Cox, Steve Lambert and Curtis Frye
3. Internet and E-mail with Windows 7 by Studio Visual Steps

LIST OF TRADE RELATED JARGON

A Frame -	A measuring device built in the shape of an A.
Aliquot -	The description of fractional section ownership used in the U.S. public land states.
Auditor's map -	A map made by the County Surveyor at the request of the auditor for tax purposes.
Azimuth -	The number of degrees from north (or other reference direction) that a line runs, measured clockwise.
Back sight -	After measuring from point A to B, reading the heading from B back to A.
Baseline -	In the U.S. Public land surveying system, a surveyed east-west (i.e. latitudinal) reference line, often hundreds of miles in length,
Bearing -	Bearings taken with a compass will be referenced to magnetic north unless otherwise noted.
Benchmark -	A survey mark made on a <i>monument</i> having a known location and elevation, serving as a reference point for surveying.
Call -	Any feature, landmark, or measurement called out in a survey.
Chain carrier -	An assistant to the surveyor, the chain carriers moved the surveying chain from one location to another under the direction of the surveyor.
Chord -	The straight line connecting the end points of an arc.
Conditional line -	An agreed line between neighbors that has not been surveyed, or which has been surveyed but not yet granted.
Corner -	The beginning or end point of any survey line.

Declination -	The difference between magnetic north and geographic (true) north. First station - See <i>Point of Beginning</i>
Flag -	A bright plastic ribbon tied to a lath stake. Used to mark points along a survey line.
Gore -	A thin triangular piece of land, the boundaries of which are defined by surveys of adjacent properties.
Landmark -	A survey mark made on a 'permanent' feature of the land such as a tree, pile of stones, etc.
Line Tree -	Any tree that is on a property line, specifically one that is also a corner to another property.
Merestone -	A stone that marks a boundary. See <i>monument</i> .
Meridian -	A surveyed north-south (i.e. longitudinal) reference line, often hundreds of miles in length, from which <i>ranges</i> are surveyed to the east and west.
Mete -	In the context of surveying, a measure, i.e. the direction and distance of a property line.
Metes and Bounds -	An ancient surveying system that describes the perimeter of a parcel of land in terms of its bearings and distances and its relationship to natural features and adjacent parcels.
Monument -	A permanently placed survey marker such as a stone shaft sunk into the ground.
Open line -	A survey line, usually the final one, that is not measured and marked (blazed) by the surveyor but is instead calculated.
Point of Beginning -	The starting point of the survey
Point of intersection -	The point where two non-parallel lines intersect.
Plat -	A drawing of a parcel of land. More specifically, the drawing created by the surveyor that shows the field work, with bearings, distances, etc.

Plot plan -	A diagram showing the proposed or existing use of a specific parcel of land.
Plunge -	1- Inversion of a transit in order to make measurements that cancel errors in the transit, or to extend a line over an obstacle. 2- The angle a falling line makes with the horizontal.
Protraction -	In the rectangular survey system, the representation of a boundary or corner not run, marked, or fixed by the field survey as evidenced by the field notes.
Quarter corner -	In the public land surveying system, a point halfway between the corners of a <i>section</i> .
Range -	In the U.S. public land surveying system, a north-south column of <i>townships</i> , identified as being east or west of a reference longitudinal <i>meridian</i> .
Riser -	A tree branch or other similar object stuck in the ground and flagged to mark a survey point.
Section -	In the public land surveying system, an area one mile square. See <i>aliquot</i> .
Standard Corner -	A corner that is on a standard parallel or base line
Strip -	A rectangular piece of land adjoining a parcel, created when a resurvey turns up a tiny bit larger than the original survey.
Tangent line -	A line that touches a circle at exactly one point and which makes a right angle with the circle's radius.
Tie line -	A survey line that connects a point to other surveyed lines.
Tier -	In the land surveying system, an east-west row of <i>towns</i> identified as being north or south of a latitudinal <i>baseline</i> .
Total station -	A survey instrument that combines a theodolite and distance meter.

- Traverse -** 1) any line surveyed across a parcel,
2) a series of such lines connecting a number of points, often used as a base for triangulation.
- Trend –** The bearing of a line along a falling course.
- Trocha -** Spanish for 'path'. In the southeast U.S. it is used for a cut or cleared survey line.
- Zenith angle -** An angle measured from a vertical reference. Zero degrees is a vertical line pointing up, 90 degrees is horizontal, and 180 degrees is straight down.

Curriculum Revision Committee

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|-----------|---|-----------------|
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