SYLLABUS FOR SURVEYOR TRADE			
FIRST YEAR			
Duration	**Reference Learning Outcome**	**Professional Skills (Trade Practical) With Indicative Hours**	**Professional Knowledge (Trade Theory)**
Professional Skill 56 Hrs.; Professional Knowledge 12 Hrs.	Concept of drawing & sheet layout following safety precautions.	1. Demonstrate of tools & equipment used in the trade. (6 hrs.) 2. Occupational safety & Health. (6 hrs.) 3. Introduction of safety equipments and their uses. (10 hrs.) 4. Introduction of first aid, health, safety & environmental guidelines, legislations & regulations as applicable. (8 hrs.) 5. Personal Protective Equipment (PPE). (8 hrs.) 6. Hazard identification and avoidance, Safety signs for Danger. (4 hrs.) 7. Use of drawing instruments and equipments with care. (4 hrs.) 8. Method of fixing of drawing sheet on drawing board. (2 hrs.) 9. Layout of different size of drawing sheet and folding of sheets. (8 hrs.)	Importance of safety and general precautions related to the trade. All necessary guidance to be provided to the newcomers to become familiar with the working of ITI system. Importance of survey or trade Job after completion of training. Introduction of First aid. Job responsibility of the trade. • Overview the subject to be taught. • List of the instrument equipments to be used during training • Layout of drawing sheet • Dimensions of drawing sheet. (12 Hrs.)
Professional Skill 84 Hrs.;	Draw lettering & numbering applying drawing	10. Lettering & numbering (Single & double stroke) (50hrs.)	Details layout of lettering, lines & dimensioning system. (18Hrs.)

Professional Knowledge 18 Hrs.	instruments.	11. Types of lines and dimensioning. (34hrs.)	
Professional Skill 28Hrs.; Professional Knowledge 06Hrs.	Draw plain geometrical figures, curves & conics	12. Construction of plain geometrical figures, curves & conics. (28 hrs.)	Introduction of surveying, types of surveying, use, application principal. (06 Hrs.)
Professional Skill 56Hrs.; Professional Knowledge 12Hrs.	Construct plain scale, diagonal scale, comparative scale, vernier scale.	13. Drawing of: - 14. Construction of scales – plain, diagonal, vernier. (56 hrs.)	Knowledge of different types of scales, determine of R.F & uses of scales. (12Hrs.)
Professional Skill 84 Hrs.; Professional Knowledge 18Hrs.	Draw orthographic projections of different objects with proper dimensioning & lettering.	15. Drawing of three views in orthographic projection of point, line, plane, solid objects. (32hrs.) 16. Section of solids. (20 hrs.) 17. Isometric projection of geometrical solids. (32hrs.)	Different types of projection views orthographic, sectional, isometric view. (18Hrs.)
Professional Skill 28Hrs.; Professional Knowledge 06 Hrs.	Draw conventional signs & symbols used in surveying.	18. Drawing of conventional signs & symbols (10hrs.) 19. Free hand sketch of liner measurement instruments(18 hrs.)	Use & application of conventional signs & symbols. (06 Hrs.)
Professional Skill 84 Hrs.; Professional Knowledge 18Hrs.	Perform site survey using chain/ tape & prepare a site plan.	20. Practice of folding & unfolding of chain. (5 hrs.) 21. Equipment and instrument used to perform surveying & testing of chain. (5 hrs.) 22. Ranging (direct/ indirect) & distance measure with chain/ tape. (10 hrs.) 23. Offset taking & entering field book. (6 hrs.) 24. Overcoming obstacles in	Uses of Chain/ tape, testing of a chain & correction. Ranging (direct & indirect), Principle of chain survey, application. Terms used in chain survey, Offset, types of offsets, limit of offset, field book, types of field book, entry of field book method of chaining in slopping ground. Field procedure of chain survey

		chaining. (6 hrs.) 25. Chaining on sloping ground. (10 hrs.) 26. Conduct a chain survey of a small area with all details and plotting the map. (20hrs.) 27. Calculating the area of site. (6 hrs.) 28. Prepare a site plan by the help of chain / tape. (16hrs.)	errors in chain survey, plotting procedure. Calculation of area (regular & irregular figure) Knowledge of site plan. (18hrs.)
Professional Skill 112 Hrs.; Professional Knowledge 24 Hrs.	Perform the site survey using prismatic compass	29. Temporary adjustment of prismatic compass. (10 hrs.) 30. Measure fore & back bearing of a line. (10 hrs.) 31. Measure true bearing of a line. (20 hrs.) 32. Prepare a closed & open traverse using prismatic compass measure the bearings, entry into field book, calculation of correct bearing and adjust. (Local attraction), determine the closing error and adjust. Plotting the same. (72hrs.)	Basic terms used in compass survey. Instrument & it setting up. Conversion of bearing web to R.B. Calculation of included angle from bearing local attraction, magnetic declination and true bearing, closing error. Adjustment of closing error, precaution in using prismatic compass. (24 hrs.)
Professional Skill 28 Hrs.; Professional Knowledge 06Hrs.	Perform Auto CAD drawing	33. Practice with AutoCAD using commands (28 hrs.)	Introduction to Auto CAD. Use AutoCAD command. (06 hrs.)
Professional Skill 84 Hrs.; Professional	Perform the site survey using the plane table.	34. Demonstration of instrument used for plane table surveying &their uses (alidade, U-	Plane table survey, principle, merits & demerits Instrument used in plane table

Knowledge 18Hrs.		fork, trough compass) Set up the plane table (24hrs.) • Centring • Levelling • Orientation 35. Practice the method of plane tabling (40hrs.) • Radiation • Intersection • Resection • Traversing 36. Determination of height by telescopic alidade (20 hrs.)	survey setting up the plane table. (centering, levelling, orientation) Methods of plane table survey (radiation, intersection, resection, traversing) Error in plane table survey. (18hrs.)
Professional Skill 84 Hrs.; Professional Knowledge 18Hrs.	Perform Theodolite survey.	37. Practice to set up the Theodolite(07hrs.) 38. Reading the vernier& booking (hor./ver.) Angle. (07hrs.) 39. Perform permanent adjustment of Theodolite(07hrs.) 40. Measurement of horizontal angle by various methods. (12hrs.) 41. Setting out the angles. (10hrs.) 42. Measurement of vertical angle, deflection angle (15 hrs.) 43. Prolongation of line by various methods. (14hrs.) 44. Determination of height of inaccessible object by Theodolite. (12hrs.)	Introduction to Theodolite. Types of Theodolite, parts of Theodolite, Terms used in Theodolite survey. Temporary adjustment of Theodolite, Angle measurement process. Reading of angles, field book entry of measured angles. Permanent adjustment of Theodolite. (18hrs.)
Professional Skill 112Hrs.;	Perform traverse survey by Theodolite&prepare	45. Traversing (closed & open) using Theodolite & tape/chain (20 hrs.)	Traversing using theodolite (closed & open), traverse computation, determination of

Professional Knowledge 24Hrs.	a site map.	46. Measurement of horizontal angles & bearing of a line. (20 hrs.) 47. Computation of coordinates from the bearing, angle length. (20 hrs.) 48. Preparation of gales traverse table (20 hrs.) 49. Computation of area using co-ordinates (20 hrs.) 50. Determine omitted measurements (12 hrs.)	consecutive coordinates, independent co-ordinate, checking & balancing of traverse, preparation of gales traverse table, computation of area using co-ordinates, calculation of omitted measurement (24hrs.)
Professional Skill 140Hrs.; Professional Knowledge 30Hrs.	Determine of RL and heights of different points by levelling instruments.	51. Practice in setting up of dumpy level and performing temporary adjustments (15 hrs.) 52. Practice in staff reading(10hrs.) 53. Practice in simple levelling (15 hrs.) 54. Practice differential levelling (fly levelling) (15 hrs.) 55. Practice reciprocal levelling. (15hrs.) 56. Carryout levelling field book. (08hrs.) 57. Equate reduction of level (rise fall method, height of instrument method) comparison of method. (15hrs.) 58. Solve problems on reduction of level. (07hrs.) 59. Practice levelling with	Introduction to levelling. Types of levelling instrument. Technical terms used in levelling Temporary & permanent adjustment. Different types of levelling Entry of level book. (Reduced level calculation method) Curvature & refraction effect sensitivity of bubble tube. Common error and their elimination. Degree of accuracy. (30hrs.)

		(auto / digital level) (15hrs.) 60. Practice profile levelling or longitudinal & cross section levelling, plotting the profile. (15 hrs.) 61. Check levelling(10hrs.)	
Professional Skill 56Hrs.; Professional Knowledge 12Hrs.	Performing tachometric survey using tacheometer	62. Determination of horizontal and vertical distances by tachometric method. (30hrs.) 63. Determination of stadia constants of a tachometer. (26 hrs.)	Introduction of tachometry & terms use advantages and disadvantages. Tachometric constants & its determination. Determination of horizontal & vertical distances by various methods. (12hrs.)
Professional Skill 84 Hrs.; Professional Knowledge 18Hrs.	Perform AutoCAD drawing (single story building)	64. Prepare traverse drawing using Auto cad. (20 hrs.) 65. Prepare a simple building (30 hrs.) 66. Drawing using Auto cad. (34 hrs.)	Use AutoCAD command for drawings. (18hrs.)
Project work/ Industrial Visit: **Broad area:** a) Prepare a traverse mapwith theodolite, & others survey instruments b) Prepare a longitudinal section (more than 300 metre). c) Draw a single-story building using AutoCAD.			

SYLLABUS FOR SURVEYOR TRADE			
SECOND YEAR			
Duration	**Reference Learning Outcome**	**Professional Skills (Trade Practical) With Indicative Hours**	**Professional Knowledge (Trade Theory)**
Professional Skill 112 Hrs.; Professional Knowledge 32 Hrs.	Make topography map using level instrument with contours.	67. Prepare contour (direct/ indirect method) (20hrs.) 68. Interpolation of contour. (15 hrs.) 69. Draw contour lines. (12 hrs.) 70. Locating contour gradients. (10hrs.) 71. Preparation of section from contour map. (15hrs.) 72. Computation of volume (prismoidal / trapezoidal) formula. (10hrs.) 73. Establishment of gradient by abney level. (10hrs.) 74. Make a topography map with contours. (indirect method) (20hrs.)	Contouring, contour interval selection of contour interval, characteristics of contour, uses of contour contouring by various method. Interpolation of contour by various methods, drawing of contours, computation of volume establishment of gradient by abney level. (32hrs.)
Professional Skill 112 Hrs.; Professional Knowledge 32 Hrs.	Concept & set out of curves.	75. Computation of elements of simple curve. (20 hrs.) 76. Set out of simple curve by linear method. (15 hrs.) 77. Set out of simple curve by instrument method. (17 hrs.) 78. Set out of compound curve by instrument method. (15hrs.) 79. Set out of reverse curve by instrument method. (15hrs.)	Curves, Purpose, Types of curves – simple, compound, reverse, transition, vertical. Elements of simple curve, computation of elements of simple curve. Various methods for setting out simple, compound, reverse, transition & vertical curve. (32 hrs.)

		80. Set out of transition curve by instrument method. (15hrs.) 81. Set out of vertical curve by instrument method. (15hrs.)	
Professional Skill 112 Hrs.; Professional Knowledge 32 Hrs.	Perform survey work using modern survey instruments (Total station) for prepare a map	82. Temporary adjustment of Total station. (20hrs.) 83. Measurement of angle & coordinates and heights. (27hrs.) 84. Traversing using Total station. (40hrs.) 85. Download survey data and Plotting. (25hrs.)	Familiarization with modern survey instruments. Parts of Total station, temporary adjustment of T.S, working procedure of T.S. (32 hrs.)
Professional Skill 28Hrs.; Professional Knowledge 08 Hrs.	Concept of cadastral survey & make a site plan	86. Prepare a site plan by the help of mouza map. (16 hrs.) 87. Calculate the plot area by digital planimeter. (12 hrs.)	Familiarisation with cadastral map, term used in cadastral survey, preliminary knowledge for prepare a site plan. Calculation of area by digital planimeter. (08hrs.)
Professional Skill 84Hrs.; Professional Knowledge 24Hrs.	Perform a road project survey.	88. Road project reconnaissance. (10hrs.) 89. Preliminary survey. (18 hrs.) 90. Final location survey including preparation of route map. (36 hrs.) 91. Profile or longitudinal &cross-sectional levelling & plotting. (20hrs.)	Types of surveys for location of a road. Points to be considered during reconnaissance survey. Classification of roads and terms used in road engineering, alignment of roads relative importance of length of road, height of embankment depth of cutting & filling, road gradients super elevation etc. (24hrs.)
Professional Skill 84 Hrs.; Professional Knowledge 24 Hrs.	Perform survey work for prepare a topographical map ,cadastral map(mouza map), road project (survey camp in a suitable hilly / undulated	92. Prepare topographical map (direct & indirect method). (28 hrs.) 93. Make a cadastral/ mouza map &calculate the plot area. (28 hrs.) 94. Prepare a detail road project more than	Details knowledge for preparation of topographical map. Details knowledge for preparation of cadastral map. Details knowledge for preparation of a road project. (24 hrs.)

	area)	1KM.(28 hrs.)	
Professional Skill 28Hrs.; Professional Knowledge 08Hrs.	PerformAutoCAD drawing from field survey data.	95. Survey drawing practice usingAutoCAD commands (28 hrs.)	Use auto cad command survey software for survey drawing. (08 hrs.)
Professional Skill 84 Hrs.; Professional Knowledge 24 Hrs.	Concept& draw cartographic projection.	96. Drawing of Simple conical projection, polyconic, lambert's & UTM (Universal Transverse Mecrcator). (34 hrs.) 97. Construction of UTM Grid. (30 hrs.) 98. Use datum defining system 1984 (WGS-84). (20 hrs.)	Importance of cartographic projection. Uses of various types of cartographic projection for mapping. (24hrs.)
Professional Skill 168Hrs.; Professional Knowledge 48Hrs.	Plan and prepare setting of GIS & GPS, techniques in various fields.	99. Setting of GPS/DGPS. (20 hrs.) 100. Data collection (measurement of line & calculation of area) (30 hrs.) 101. Data collection in DGPS mode. (25 hrs.) 102. Processing of GPS data in software. (20 hrs.) 103. Plotting the contour lines with the help of Auto Civil/ Civil 3D Software/any other software. (73 hrs.)	Introduction of GIS& GPS. Elements of GPS/DGPS. Observation principles. Sources of error & handling of error in GPS. Various type of GPS application. Concept & use of survey software. (48hrs.)
Professional Skill 84 Hrs.; Professional Knowledge 24 Hrs.	Perform the hydrographic survey (cross section & velocity determination) using the hydrographic survey	104. Determine hydro graphic depth by (sounding method)/ eco sounder. (28 hrs.) 105. Measure the velocity of flow. (24 hrs.) 106. Determine the cross-	Introduction to hydrographic survey, practice various method s of water depth measurement process, floe velocity measurement & determination of cross-sectional area of a river.

	instruments.	sectional area of a river. (20 hrs.) 107. Calculate the discharge of a river (12 hrs.)	Handling of eco sounder, current meter. (24hrs.)
Professional Skill 56 Hrs.; Professional Knowledge 16Hrs.	Perform transmission line site survey & prepare a site plan.	108. Justify constructing a new transmission line. (06hrs.) 109. Marking of tentative alignment on existing topographical map. (08hrs.) 110. Conduct reconnaissance /preliminary survey & select a good alignment. (12hrs.) 111. Conduct detailed survey, prepare a profile drawing using sag template. (12 hrs.) 112. Conduct final location survey. (12 hrs.) 113. Mark tower foundation pit point (as per type of tower) (06hrs.)	Basic terms used in transmission line survey, justification criteria for constructing new line, marking process of tentative alignment, selection process of a good alignment. Process of detail survey & final location survey. Use of sag template, Various type of tower, construction of tower foundation. (16hrs.)
Professional Skill 56 Hrs.; Professional Knowledge 16Hrs.	Perform the railway line site survey using modern survey instruments.	114. Justify to construct a new Railway line. (06 hrs.) 115. Marking of tentative alignment. (08 hrs.) 116. Conduct reconnaissance /preliminary survey & select a good alignment. (15 hrs.) 117. Conduct detailed survey, prepare of drawing including design of curves with setting out table. (15hrs.) 118. Conduct final location	Basic terms used in railway line project survey, justification criteria for constructing new line, marking process of tentative alignment, selection process of a good alignment. Process of detail survey & final location survey. (16hrs.)

		survey. (12hrs.)	
Professional Skill 112Hrs.; Professional Knowledge 32Hrs.	Draw a double storied building by AutoCAD& prepare a detailed estimate of building.	119. Draw a double storied residential building plan, elevation, cross section, site plan, lay out plan, foundation details etc. (78 hrs.) 120. Prepare a detail estimate of this building. (34 hrs.)	Specification & uses of various types of building materials, types of foundation, knowledge of R.C.C. works, & other construction related items. Procedure of prepare a detail estimate. (32hrs.)
Project work a) Prepare a two storied residential building plan & prepare a detail estimate.			