LAND SURVEYING ASSISTANT(LSAS)

Core Qualification File Syllabus

Duration: 168 Hrs. (Theory: 72 hrs. Practical: 96 hrs.)		
Sl No.	**Trade Theory**	**Trade Practical**
1.	Carry out basic civil/drafting work, draw plane figures used in field of work by applying drawing instruments with proper scale. (6 hrs)	Demonstrate the: (9 hrs) 1. Concept of scale, types of scale used in civil engineering drafting work. 2. Concept of R.F. 3. Conversion of plot length into actual length in the field. 4. Concept of plan, elevation, side view and sectional view of civil engineering structure.
2.	Definition of plane Surveying, Classification of Surveying based on 1) instrument use and 2) nature of field. (6 hrs)	Demonstrate the: (9 hrs) 1. Identification of different type of instruments and accessories used in field surveying. 2. Storage of all the instruments and tools related to Surveying. 3.Maintenance of all the instruments and tools related to surveying
3.	Chain and Compass Surveying and its application: Instruments required in brief & operation of chain and surveying & correction in chain and Compass Surveying. (12 hrs)	Demonstrate the: (12 hrs) 1. Identification of different type of chain and tapes and their various components/parts. Unfolding and folding of chain. Taking of linear measurement. 2. Identification of different types of Compass and their various components/parts. Setting of compass on tripod stand and taking of bearing of a line. General idea of traversing by compass. Packing/boxing of compass. 3. Identification of different tools and accessories used in Chain and Compass Surveying. 4. Field book and field book entry. 5.Plotting of field data and preparation of map 6. Storage of all the instruments and tools related to Chain and Compass Surveying. Maintenance of all the tools related to surveying
4.	Plane Table Surveying & its application: Instruments required in brief & their operation. (10 hrs)	Demonstrate the: (9hrs) 1. Fixing of plane table with tripod stand. 2. Identification of various accessories and their uses. 3. Centring, leveling and orientation operation of Plane table. 4, Filling of field details on the travers prepared by compass surveying. 5. How to sift whole plane table with stand to set over another station.
5.	Levelling: Instruments required. Different part of Dumpy level, auto level and their Operation and function. (10 hrs)	1.Identify the various parts of level machine , types of staff and tripod stand. 2.Perform setting up and centring of the a. dumpy level, b. auto level,

		3. Demonstrate the following operations a. identification of station mark and bench mark b. mounting the instrument on tripod and adjusting the height of the tripod c. centring the instrument over station mark and do the all temporary adjustment. 4. Taking staff reading and level book entry 5. Plot form the field book for a long section profile levelling of 30 m interval. 6. Unboxing and boxing machine and storing of machine, staff, Stand including all accessories. (12 hrs)
6.	Theodolite & its application: Different part of theodolite and their Operation and function. (10 hrs)	1.Perform setting up and centring of the theodolite, 2. Measurement of horizontal angle/included angle of closed traverse and vertical angle and height of a building. 3. Prolonging or extending a line or fixing intermediate point between end points of a line. 4. Fixing a given angle in theodolite. 5. General idea of traversing by Theodolite. 6. Unboxing and boxing machine and storing of machine, staff, Stand including all accessories. (15 hrs)
7.	Total station and GPS & its application (18 hrs)	Angular, Liner Measurements leveling operation using Total Station 1.Set up the instrument at appropriate location, carry out the temporary adjustments and input primary data such as project code, file name, temperature, station point, type of measurement etc. 2.Correctly identify and locate the staff points in order to obtain readings 3. Obtain all the reading by bisecting the reflective prism mounted on the staff accurately with the telescope 4. Remove the data card and transfer the collected readings into the computer. 5. Demonstration of hand held GPS, recording of data and remove the data card and transfer the collected readings into the computer. 6. Unboxing and boxing machine and storing of machine and all accessories. (20 hrs)
8.	Setting out works.	1. Demonstrate the accessories required for Layout of building, culvert and pier of a bridge. 2. Layout of building t with the help of theodolite or 3-4-5 method and layout of culvert and pier of a bridgewith the help of theodolite. 3. Sifting of intersecting points at a distance of 1.5 to 2 m. 4. Unboxing and boxing machine and storing of machine and all accessories. (5 hrs)
9.	Study of Mouza map/ cadastral map, and City map.	1. Determine the boundaries of field, estate, houses, street, water supply and sanitary systems etc. 2.Calculation of area of field/estate/plot in mouza map etc (5 hrs)

OUTCOMES

Outcomes to be assessed	Assessment criteria for the outcome
1. Identify and use drawing instruments to carry out basic civil/drafting work	1.1 Ensure data & information received are sufficient for preparation of drawing.
	1.2 Prepare layout of drawing sheet
	1.3 Prepare a title box
	1.4 Set & fix drawing paper on the drawing board
	1.5 Draw, horizontal line, vertical line, parallel line using T-square, set- square
	1.6 Draw different types of scales
	1.8 Demonstrate the following:
	a. Concept of scale, types of scale used in civil engineering drafting work.
	b. Concept of R.F. Find out R.F of the scale, calculate the length of the scale on drawing
	c. Conversion of plot length in drawing into actual length in the field.
	d. Mark a particular distance in Diagonal scale upto two decimal points.
	e. Concept of plan, elevation, side view and sectional view of civil engineering structure.
	1.9 Draw some conventional signs & symbols used in survey maps.
2. Identify and maintain different survey material, tools and equipment	2.1 Explain the role of surveyor and its importance
	2.2 Explain various types of survey materials used in surveyor and Knowledge of measurements and its conversion to other system.
	2.3. Identify different tools and equipment used in the survey. Measure length in MKS & FPS system
	2.4 Storage of all the instruments and tools related to Surveying.
	2.5 Maintenance of all the instruments and tools related to surveying.
3. Demonstrate Chain and Compass Surveying using all relevant instruments and tools.	3.1 Explain the terms used in chain and tape surveys.
	3.2 Explain different types of chain and tape.
	3.3 Demonstrate unfolding and folding of a chain and different parts of chain viz. link, tally, handle etc.
	3.4 Identification of different tools and accessories used in Chain and Compass Surveying.
	3.5 Demonstrate taking measurements using chains.
	3.6 Demonstrate taking off offset distance with tape.
	3.7 Demonstrate measurements in field book using chain survey of small plots by triangulation, booking and plotting.
	3.8 Explain terms used in compass Survey.
	3.9 Demonstrate setting up a Compass
	3.10 Explain types of compass and their adjustment
	3.11Explain bearings and their types and angles in compass survey.
	3.12 Demonstrate measurement of angles or bearings by compass.
	3.13 Explain the calculation and conversion of bearings from one system to another
	3.14 Demonstrate open and closed traverse in compass survey.
	3.15. Plotting of a close traverse. From a field book entry.
	Storage of all the instruments and tools related to Chain and Compass Surveying. Maintenance of all the tools related to Chain and Compass surveying
4. Apply Plane Table Surveying using all instruments.	4.1. Explain terms used in plane table Survey.
	4.2 Demonstrate the following:
	a. Fixing the plane table with a tripod stand.

	b. Identification of various accessories and Explain the uses of those tools in plane table survey
	c. Centering, leveling and orientation operation of Plane table
	d, Filling of field details on the travers prepared by compass surveying.
	e. How to sift the whole plane table with a stand to set over another station.
5. Illustrate operation of Levelling Instruments like Dumpy level, auto level etc	5.1 Identify the various parts of the level machine,types of staff and tripod stand.
	5.2.Perform setting up and centering of the a. dumpy level, b. auto level,
	5.3. Demonstrate the following operations
	a. identification of station mark and bench mark
	b. mounting the instrument on the tripod and adjusting the height of the tripod .
	c. centering the instrument over the station mark and do the all temporary adjustment.
	d. Taking staff reading and level book entry
	5.4. Plot from the field book for a long section profile levelling of 30 m interval.
	5.6. Unboxing and boxing machine and storing of machine, staff, Stand including all accessories.
6. Use Theodolite for survey work.	6.1 Identify different parts of theodolite and various types of screw in theodolite.
	6.2. Perform setting up and centering of the theodolite.
	6.3. Measurement of horizontal angle/included angle of closed traverse and vertical angle and height of a building.
	6.4. Prolonging or extending a line or fixing intermediate points between end points of a line.
	6.5. Setting a given angle in theodolite.
	6.6. General idea of traversing by Theodolite.
	6.7. Unboxing and boxing machine and storing of machine, staff, Stand including all accessories
7. Use Total station and GPS	7.1 Identify different parts of Total station and various types of screw in Total station.
	7.2 Set up the instrument at appropriate location, carry out the temporary adjustments and input primary data such as project code, file name, temperature, station point, type of measurement etc.
	7.3. Correctly identify and locate the staff points in order to obtain readings.
	7.4. Obtain all the reading by bisecting the reflective prism mounted on the staff accurately with the telescope.
	7.6 Angular, Liner Measurements and leveling operation using Total Station.
	7.7 Remove the data card and transfer the collected readings into the computer.
	7.8 Demonstration of hand held GPS Setup GPS, recording of field data using GPS and remove the data card and transfer the collected readings into the computer and Plot the map by software
	7.9 Unboxing and boxing machine and storing of machine and all accessories.
8. Demonstrate Layout of building, culvert and pier of a bridge.	8.1. Demonstrate the accessories required for Layout of building, culvert and pier of a bridge.
	8.2. Layout of building with the help of theodolite or 3-4-5 method and layout of culvert and pier of a bridge with the

	help of theodolite.
	8.3. Sifting of intersecting points at a distance of 1.5 to 2 m.
	8.4. Unboxing and boxing machine and storing of machine and all accessories
9. Study of Mouza map/ cadastral map, and City map.	9.1. Determine the boundaries of fields, estate, houses, street, water supply and sanitary systems etc.
	9.2. Calculation of area of field/estate/plot in mouza map etc.