



Kot Bhalwal, Jammu

Model Institute of Engineering
& Technology (Autonomous)
Course Handout

COURSE HANDOUT

SURVEYING-I (CE-303)

B.E. (CE) – 3rd SEMESTER

ACADEMIC YEAR (2024-25)

Mr. Sarvdaman Sharma

Assistant Professor

Department of Civil Engineering



Department of Civil Engineering

Model Institute of Engineering & Technology (Autonomous)

Kot Bhalwal, Jammu - 181122

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Dr. Arun K. Gupta Teaching-Learning Centre

Version 1.1



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Course Code	Course Name	Course Type	Cd	L	T	P	Marks		
							Sessional	Final Exam	Total
CE-303	Surveying-I	PCC	5	4	1	0	50	100	150

COURSE OUTCOMES

At the end of the course the student will be able to:	
CO1	Carry out surveying in the field for various Civil Engineering projects.
CO2	Understand traverse surveying and its adjustments by various methods.
CO3	Measure accurately using different surveying instruments.
CO4	Prepare a contour plan and map of the area.
CO5	Perform theodolite survey for horizontal and vertical heights.

Section-A

Unit-I

Chain survey: Classification of surveys, reconnaissance, principles-provision of control, conventional signs. Chain survey: instruments, principles of chain survey, field book, plotting - tie line and check line, chaining and ranging obstacles. Chaining on sloping ground, errors, uses of cross staff and optical square.

(6 Hours)

Unit-II

Levelling and contouring: Definition of terms used in levelling, types of levels and staff, temporary adjustment of levels, principles of levelling, reduction of levels, booking of staff readings, examples. Definition, representation of reliefs, horizontal equivalent, contour interval, characteristics of contours, methods of contouring, contour gradient, uses of contours maps.

(8 Hours)

Unit-III

Compass and plane table: Prismatic compass, surveyor's compass, whole circle, reduced bearing-true and magnetic bearing dip. Declination, local attraction, traversing, plotting, error of closure, graphical and analytical adjustments Plane table, methods of plane table surveying, radiation, intersection, traversing and resection, Two point and three point problems.

(8 Hours)

Section-B

Unit-IV

Trigonometric levelling: Definition of level surfaces, mean sea level, reduced level, bench marks, levelling instruments, temporary and permanent adjustments, fly levelling, booking, reduction of levels, corrections for refraction and curvature, reciprocal levelling, longitudinal levelling. Computation of volume by trapezoidal and prismoidal formula, volume from spot levels, volume from contour plan, trigonometric levelling considering refraction and curvature correction, axis signal correction.

(8 Hours)

Unit-V

Theodolite Surveying: Various parts, axis of transit, technical terms, temporary adjustments. Measurement of horizontal and vertical angles, method of repetition and reiteration; theodolite traverse - different methods of running theodolite traverse, gales's traverse table, balancing of traverse by bow-ditch's transit and modified transit rules; problems on one-plane and two-plane methods, omitted measurements, errors in theodolite survey.

(8 Hours)



Textbooks

S.No.	Name of the Books	Name of the Author	Publisher Name	Edition (Pub.Yr.)
1	Surveying Vol.I & II	S.K. Duggal	Tata McGraw Hill	13th (2020)
2	Advanced Surveying:	Madhu, N, Sathikumar, R and Satheesh Gobi	Pearson India	2nd (2006)
3	Geomatics Engineering	Manoj, K. Arora and Badjatia	Nem Chand & Bros	1 st (2011)

Reference Books

S.No.	Name of the Books	Name of the Author	Publisher Name	Edition (Pub. Yr.)
1	Surveying and Levelling Vol. I and II	Bhavikatti, S.S	I.K. International	1st (2014)
2	Remote sensing and Geographical information system	Anji Reddy, M.	B.S. Publications	1st (2012)

COURSE PLAN

Unit-I Chain Survey

S.No	Topics	Recommended Books
1	Chain survey: Classification of surveys	Book 2, Ch.1
2	Reconnaissance	Book 2, Ch.3
3	Principles of chain survey	Book 2, Ch.3
4	Field book	Book 2, Ch.1
5	Plotting of tie line and check line	Book 2, Ch.2
6	Chaining on sloping ground and uses of cross staff and optical square.	Book 2, Ch.2

Unit-II Levelling and Contouring

7	Definition of terms used in leveling.	Book 2, Ch.8
8	Types of levels and staff.	Book 2, Ch.8
9	Temporary adjustment of levels.	Book 2, Ch.8
10	Booking of staff reading	Book 2, Ch.8
11	Reduction of levels	Book 2, Ch.9
12	Characteristics of contours,	Book 2, Ch.9
13	Contour gradient	Book 2, Ch.9
14	Uses of contours maps	Book 2, Ch.9



Unit-III Compass and Plane Table		
15	Prismatic compass, surveyor's compass	Book 4, Ch.2
16	Local attraction	Book 4, Ch.2
17	Whole circle and reduced bearing-true and magnetic bearing, dip.	Book 4, Ch.2
18	Declination, local attraction, traversing	Book 4, Ch.4
19	Graphical and analytical adjustment of traverse	Book 4, Ch.4
20	Plane table	Book 4, Ch.5
21	Methods of plane table surveying	Book 4, Ch.5
22	Two point and three point problems	Book 4, Ch.5
Unit-IV Trigonometric Levelling		
23	Definition of level surfaces, mean sea level, reduced level.	Book 4, Ch.11
24	Levelling instruments, temporary and permanent adjustments	Book 4, Ch.11
25	Fly levelling	Book 4, Ch.11
26	Corrections for refraction and curvature	Book 4, Ch.11
27	Reciprocal levelling, longitudinal levelling	Book 4, Ch.11
28	Computation of volume by trapezoidal and prismoidal formula	Book 4, Ch.11
29	Trigonometric levelling	Book 4, Ch.12
30	Axis signal correction	Book 4, Ch.12
Unit-V Theodolite Surveying		
31	Various parts, axis of transit and other technical terms.	Book 4, Ch.8
32	Measurement of horizontal and vertical angles	Book 4, Ch.8
33	Method of repetition and reiteration.	Book 4, Ch.9
34	Theodolite traverse - different methods of running theodolite traverses.	Book 4, Ch.9
35	Gales traverse table	Book 4, Ch.10
36	Balancing of traverse by bow-ditch's transit and modified transit rules;	Book 4, Ch.10
37	Omitted measurements, errors in theodolite survey	Book 4, Ch.10
38	Problems on one-plane and two-plane methods	Book 4, Ch.10

ADDITIONAL WEB RESOURCES

1.	NPTEL: Video lectures on Surveying-I Lecture series by Prof. J.K Gosh, Department of civil engineering, IIT Roorkee. https://nptel.ac.in/courses/105107122
2.	NPTEL: Video lectures on Surveying-I Lecture series by Prof. Bharat Lohani, Department of Civil Engineering, IIT Kanpur. https://nptel.ac.in/courses/105104101



GRADING AND ASSESSMENT

- **Sessional Test:** 20 marks
- **Assignment:** 20 marks
- **Attendance:** 10 marks
- **Final Examination:** 100 marks

COURSE POLICIES

- **Attendance:** Minimum 75% attendance is mandatory to appear in the final examination of the course.
- **Academic Integrity:** MIET's academic integrity policies apply. Plagiarism will not be tolerated.
- **Late Submissions:** Assignments and projects must be submitted by the specified timelines.

FACULTY INFORMATION

- **Office Hours**
Monday (12:05 PM - 12:55 PM)
Friday (12:05 PM - 12:55 PM)
- **Contact Information**
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