BASIC SURVEYING

ENGE 201

Lecture : 3 **Year : II**
Tutorial : 0 **Part : I**
Practical : 4

Course Objectives:
The objective of this course is to introduce students with the basic knowledge of land measurement and surveying techniques. The overall course is designed to make the students able to learn and understand the theory and practice of basic survey measurements.

1 Introduction (4 hours)

1.1 Historical background to the development of surveying
1.2 Principle of surveying
1.3 Traditional and modern surveying instruments
1.4 Modern disciplines of surveying and their significance
1.5 Maps and map scale

2 Theory of Measurements and Errors (4 hours)

2.1 Units of measurements and conversion
2.2 Significant figures, rounding of numbers
2.3 Accuracy and precision
2.4 Types, sources of errors
2.5 Instruction on field works

3 Linear Survey (5 hours)

3.1 Instruments used for linear survey
3.2 Types of chain and tapes
3.3 Terms related to chain surveying
3.4 Principles of chain surveying
3.5 Operation in chaining
3.6 Testing and adjustment of chain
3.7 Methods of chaining in various conditions
3.8 Errors in chaining and taping
3.9 Obstacles in chaining
3.10 Tape corrections

4 Compass Survey (8 hours)

4.1 Definitions and terminologies
4.2 Types of compasses
4.3 Temporary adjustment of compass
4.4 Designation of bearing
4.5 Types of bearing
4.6 Included angles and bearing
4.7 Local attraction, magnetic declination
4.8 Typical compass problem.
4.9 Compass traversing, errors and adjustment

5 Plane Table Survey (4 hours)

5.1 Principles of plane table survey
5.2 Methods of plane table survey
5.3 Advantages and disadvantages of plane table survey

6 Leveling (6 hours)

6.1 Introduction
6.2 Principle of leveling and differential leveling
6.3 Leveling instruments and accessories (Abney level, Clinometer, Tilting level, Automatic level)
6.4 Terminology used in leveling and their uses
6.5 Types of leveling
6.6 Two peg and Princeton test
6.7 Temporary and permanent adjustment of level
6.8 Booking and calculation of reduced level
6.9 Sources of errors

7 Theodolite and Theodolite Traversing (6 hours)

7.1 Theodolite instruments and its construction
7.2 Terminology used and its functions
7.3 Temporary adjustment of theodolite
7.4 Measurement of angles
7.5 Traversing and its types
7.6 Traversing method and adjustment
7.7 Balancing of traverse
7.8 Plotting of traverse

8 Tacheometry (8 hours)

8.1 Basic principle of tacheometry
8.2 Instruments used for tacheometry
8.3 Methods of tacheometry
8.4 Analytical lens
8.5 Derivation of tacheometry formula

Practical (60 hours)

1. Horizontal, Vertical and slope distance measurement
2. Chain survey and detailing
3. Plane table survey
4. Compass survey
5. Two peg test and differential leveling, profile levelling
6. Angular measurement using theodolite
7. Preparation of topographic map

Final Exam

The questions will cover all the chapters in the syllabus. The evaluation scheme will be as indicated in the table below:

Chapters	Hours	Marks distribution*
1,2	8	10
3,5	9	12
4	8	12
6	6	8
7	6	8
8	8	10
Total	**45**	**60**

* There may be minor deviation in marks distribution.

References

1. Bannister, A., Raymond S., Baker R. (1998). Surveying (7th edition). Pearson.
2. Wolf, P.R., Brinker, R.C. (2010). Elementary Surveying, Harper Collins college publishers.
3. Davis, R. E. (1981). Surveying Theory and Practice. United Kingdom: McGraw-Hill.
4. Duggal S.K. (2013). Fundamentals of surveying. Tata McGraw - Hill Education.
5. Punmia B.C., Jain A.Kr., Jain A.K. (2005). SURVEYING VOL. I; VOL II & VOL III. Laxmi publication.