AMSV19 SURVEYING & GEOMATICS

UNIT-1 INTRODUCTION TO SURVEYING

1.1 Definition, Classification, Principles, Survey stations and Survey lines;

1.2 Introduction to measurement of distance, direction and elevation; Ranging and it methods, Meridians and Bearings,

1.3 Methods of levelling, Booking and reducing levels, Reciprocal levelling, distance of visible horizon, Profile levelling and cross sectioning, Errors in levelling;

1.4 Introduction to methods of plane table surveying; Contouring: Characteristics, methods, uses, computation of areas and volumes.

1.5 Theodolite survey: Instruments, Measurement of horizontal and vertical angle; Methods of horizontal and vertical control,

1.6 Triangulation: Figures or systems, Signals, Satellite station, Baseline and its importance, corrections, Trigonometric levelling: Accessible and inaccessible objects.

UNIT-2 CURVES

2.5 Elements of simple circular curves,

2.6 Theory and methods of setting out simple circular curves,

2.7 Transition curves- types,

2.8 Characteristics and equations of various transition curves;

2.9 Introduction to vertical curves.

UNIT-3 MODERN FIELD SURVEY SYSTEMS

3.1 Principle and types of Electronic Distance Measurement systems and instruments,

3.2 Total Station- its advantages and applications;

3.3 Global Positioning Systems- Segments, working principle, errors and biases.

3.4 Geographic Information System: Concepts and data types, data models, data acquisition.

3.5 GIS applications in civil engineering.

UNIT-4 PHOTOGRAMMETRIC SURVEY

4.1 Basic principles, aerial camera, scale of a vertical photograph,

4.2 Relief Displacement of a vertical photograph, height of object from relief displacement,

4.3 Flight planning for aerial photography,

4.4 Selection of altitude, interval between exposures, crab and drift,

4.5 Stereoscope and stereoscopic views, parallax equations. Introduction to digital photogrammetry.

UNIT-5 REMOTE SENSING

5.1 Concepts and physical basis of Remote Sensing, Electromagnetic spectrum, atmospheric effects, image characteristics.

5.2 Remote sensing systems, spectral signatures and characteristics spectral reflectance curves.

5.3 Salient features of some of Remote Sensing satellites missions.

5.4 Digital image processing: Introduction, image rectification and restoration, image enhancement, image transformation, image classification.

5.5 Applications of remote sensing to civil engineering.

References Books

1. Madhu, N, Sathikumar, R and Satheesh Gobi, Advanced Surveying: Total Station, GIS And Remote Sensing, Pearson India, 2006.
2. Manoj, K. Arora and Badjatia, Geomatics Engineering, Nem Chand & Bros, 2011
3. Bhavikatti, S.S., Surveying and Levelling, Vol. I and II, I.K. International, 2010
4. Chandra, A.M., Higher Surveying, Third Edition, New Age International (P) Limited, 2002.