ADVANCED SURVEYING (Professional Elective- I)

Course Code: 20CE1150

LTPC 3 0 0 3

Pre-requisites: Surveying and Geomatics, Physics, Mathematics

Course Outcomes:

At the end of the course the student will able to:

CO1: Discuss the different types of horizontal curves as simple and compound curves (L2)

CO2: Explain about Reverse and Transition curves (L2)

CO3: Explain the applications and importance of Total station (L2)

CO4: Describe about the Photogrammetric surveying and compute the scale of photograph (L3)

CO5: Discuss the importance of GIS and Mapping (L2)

UNIT-I

SIMPLE AND COMPOUND CURVES:

Simple curves - Elements of simple curves - Methods of setting simple curves - Rankine's method - Two Theodolite method- Compound curves - Elements of compound curves

Learning outcomes:

At the end of the unit, the student will be able to

- 1. explain the elements of simple curves (L2)
- 2. describe the methods of setting simple curves (L2)
- 3. discuss the elements of compound curves (L2)

UNIT-II

REVERSE AND TRANSITION CURVES:

Reverse curves – Elements of reverse curve – Determination of various elements of a Transition curves - Setting out methods

Learning outcomes:

At the end of the unit, the student will be able to

1. explain the elements of the reverse curve (L2)

- 2. describe the methods of setting the reverse curve (L2)
- 3. discuss the elements of transition curves (L2)

UNIT-III

TOTAL STATION:

Introduction to Total station, components used in Total Station surveying, Brief Description of important operations, Applications of Total station, Advantages and Disadvantages.

Learning outcomes:

At the end of the unit, the student will be able to

- 1. list out the components of total station (L2)
- 2. discuss the applications of total station (L2)
- 3. explain the advantages and disadvantages of total station (L2)

(10 Lectures)

(10 Lectures)

(10 Lectures)

UNIT-IV

PHOTOGRAMMETRIC SURVEYING:

Introduction, Basic principles, The photo theodolite, Definitions, Horizontal and Vertical angles from terrestrial photograph, Horizontal position of a point from photographic measurement, Elevation of a point by photographic measurement, Determination of focal length of the lens, Aerial camera, Scale of a vertical photograph, Scale of a tilted photograph, Flight planning for aerial / drone photography, The ground control for photogrammetric, Aerial and close range photogrammetric.

Learning outcomes:

At the end of the unit, the student will be able to

- 1. explain the basic principles of photogrammetry (L2)
- 2. calculate the scale of the photograph (L3)
- 3. describe the flight planning and ground control of photography (L2)

UNIT-V

(10 Lectures)

GIS AND MAPPING:

Introduction to Geographic Information System (GIS), The four Ms, Contributing Disciplines for GIS, Objectives, components, Data Models, Data Structures, Database Management, Errors in GIS,GIS Software packages, Linkage of GIS to Remote sensing, Application areas of GIS and Remote sensing.

Learning outcomes:

At the end of the unit, the student will be able to

- 1. explain the data models in GIS (L2)
- 2. describe the data structures and database management systems in GIS (L2)
- 3. discuss the application area of GIS (L2)

Text Books:

- 1. Duggal S K, "Surveying" (Vol –2), 10th Edition, TataMcGraw Hill Publishing Co. Ltd. New Delhi, 2004.
- 2. B.C.Punmia, Ashok Kumar Jain and Arun Kumar Jain, "Surveying" (Vol 2&3), 18th Edition, Laxmi Publications(P) Ltd., New Delhi, 2011.

References:

- 1. Arthur R Benton and Philip J Taety, "Elements of PlaneSurveying" 8th Edition, McGraw Hill, 2010.
- 2. Arora K R "Surveying" (Vol 1, 2 & 3), 9th Edition, Standard Book House, Delhi, 2008.
- 3. Chandra A M, "Plane Surveying", 4th Edition, New Age International Pvt. Ltd. New Delhi, 2009.