Course Type	Course Code	Name of the Course	L	T	P	Credits
DP3	**NMNC514**	Advanced Surveying Lab	0	0	3	1.5

Course Objective
The course objective is to impart practical knowledge on the state-of-the-art techniques for measuring distances, angles and associated errors using different modern surveying techniques. Data processing and plotting using GPS and GNSS
Learning Outcomes
Upon successful completion of this course, students will: • learn the method of measurement of distances, angles and plotting contours for mines. • learn the advanced technology for data processing and its usage for measuring and monitoring mine slopes and others.

Unit No.	Topics to be Covered	Contact Hours	Learning Outcome
1	Linear Measurement: Chain, Tape and Distometer	3	Students will learn the basic measurement of distance using chain, tape and distometer
2	Theodolite Traversing and distribution of closing errors	3	Students will learn the distribution of closing error using theodolite
3	Levelling with Auto Level and Digital Level and distribution of closing errors	3	Students will learn how to perform levelling
4	Application of Total Station: Measurement of distance, angle between two stations, coordinates, missing line measurement, offsetting, resection	3	Students will learn the complete use and function of total station
5	Traversing with Total Station and adjustment of Error	3	Students will learn the traversing and error adjustment using total station
6	Field data downloading and processing to prepare the Grids, Contours, Plans and Section	3	Students will learn the plotting and processing of data for preparing contours and plans
7	Gyromat: Determination of Gyro-north	3	Students will learn the basic features and uses of gyromat
8	Study of Nadir Plummet and LASER for Correlation survey	3	Students will learn the principles of correlation survey with plummet and LASER
9	Study of GPS and GNSS Surveying; GNSS data collection	3	Students will learn the GPS and GNSS data collection
10	GNSS data download and processing	3	Students will learn post processing of GNSS data
11	Monitoring of Open Pit Slopes and Subsidence through Advanced Surveying Techniques: Geodetic approaches in slope monitoring	3	Techniques and guidelines for dump slope, rock slope and subsidence monitoring.
12	Data preparation for Mine Plan and earth work calculations	3	Processing of Survey data for all statutory and planning requirements in mines including preparation of computer aided plans, sections, and earthwork calculations.
	Mini Project	3	
	Practice & Review	3	
	Total	42	

Text Books:

1. Punmia, B. C. (2005), Surveying Vol. 1 and II
2. Schofield, W. and Breach M. (2006), Engineering Surveying

Reference Book

1. Advances in Surveying Technology: Lecture Notes by faculty Text Books: