Course Type	Course Code	Name of Course	L	T	P	Credit
DP10	**MNC307**	**Numerical Modelling / Remote Sensing & GIS Lab. (Modular)**	0	0	2	2

Course Objective

To provide skills in operating latest software in numerical modelling, remote sensing and GIS applications

Learning Outcomes

will be able to design various structures in rock will
be able to process various remote sensing data
apply GIS and SAR to predict mine subsidence

Sl. No.	Major Topics	No. of Practicals	Learning outcomes
	Numerical Modelling		
1	To perform finite element analysis of stress around a circular tunnel	1	basics of applying 2D numerical modelling
2	Study effect of mesh size on stress distribution around the circular tunnel and comparing the numerical solution with closed form solution	1	influence of mesh size on results of numerical modelling
3	Modelling of underground excavations in massive rockmass	1	understanding of 3D numerical modelling
4	To perform finite element analysis of a rib pillars and Modelling of sequence of excavation and design of stopes/cavern	1	solving metal mining geotechnical problems
5	Modelling of mechanical behaviour of pillars under different geo-mining conditions	1	modelling of coal mine pillars and understanding its strength behaviour
6	Modelling of a hydroelectric cavern and gas oil storage cavern	1	solving problems w.r.t. large civil underground structure
	Remote Sensi ng & GIS Lab.		
7	Introduction to different types of remote sensing data products	1	Remote sensing data products and their uses in various applications
8	Visual interpretation of various features and Analysis on a satellite data.	1	data processing of satellite data and interpretation of results
9	Demonstration on various GIS software's and their salient features	1	An overview of the capabilities of GIS platform for a series of mining applications
10	Georeferencing of various maps and Satellite image & Digitisation for documentation of Mine Lease Boundaries	1	Geo-referencing and digitisation of cadastral map with lease boundary of mining areas
11	Preparation of Land Use/ Land Cover Map from the satellite data	1	Land pattern usages and change detection within lease area of mine
12	Mine subsidence modeling using Spaceborne SAR interferometry technique	1	Radar image processing to estimate subsidence.