

Course Type	Course Code	Name of the Course	L	T	P	Credits
DP	NMNC530	Mine Surveying Camp	0	0	3	1.5

Course Objective			
<p>The objective of Mine Surveying Camp is</p> <ul style="list-style-type: none"> To develop skills on modern mine surveying tools through a series of field-oriented exercises, comprising of data acquisition, processing and analysis, and preparation of 3D maps/plans including reports, etc. application of modern tools and techniques in mine surveying. The field exercises will enable learning on the best surveying practices in mines including legislation requirements. The exercises have been designed taking into the need of capturing 3D data for mine digitization, modelling, and planning. 			
Learning Outcomes			
<ul style="list-style-type: none"> Students will have thorough hands-on knowledge on day-to-day requirements of mine surveying for mine development, operations and planning using the modern surveying tools and technologies 			
Units	Course Content	Contact hours	Learning Outcomes
Unit 1	Theodolite Traversing with adjustment of traverse and transfer of baseline using Bowditch Rule	6	Students will be able to establish control stations in the mine
Unit 2	Total Station Traversing with data download and plotting using CAD tools	6	Learning on digital mapping and 3D map preparation
Unit 3	Transfer of BM using auto set/precise/digital level and adjustment of errors as per CMR/MMR	6	A complete understanding on setting of BMs at mine entries as per statutory provisions
Unit 4	DGPS surveying using GNSS and georeferencing of cadastral maps	6	Knowledge on Lease Boundary pillar survey
Unit 5	3D Terrestrial Laser Scanning and Volumetric estimation of earthworks	6	Complete understanding on estimation of excavation quantity (Overburden and Mineral) in a mine
Unit 6	Correlation and Alignment Surveying using laser Gyro and North Determination	6	Knowledge on orientation and alignment of tunnels and development galleries
Unit 7	Spot levelling and Contouring using Total Stations	6	Preparation of Topographical maps
Total		42	

The Mine Surveying Camp will be organized for a period of one week (42 hours) after the completion of winter semester end term examination.