GOVERNMENT OF INDIA

GEOLOGICAL SURVEY OF INDIA TRAINING INSTITUTE

HYDERABAD

SCHEME: Special Course **PROPOSED YEAR: 2024-25**

1. Administrative details

Course Name	Duration	Maximum Seats	Minimum Seats	Stream
Geological Exploration & Resource Estimation	03-07-2024 to 30-07-2024	20	10	Geological Exploration & Resource Estimation

Course Title	Geological Exploration & Resource Estimation		
Stream	Engineering and Technology		
Course Director	S.P Bhutia, Director		
Course Duration:	from 03-07-2024 to 30-07-2024 ; 4 weeks		
No. of days of training	days =24	170 learning hrs (approximate)	
Accommodation	Hostel	Distance from Campus	within campus
	GSITI Hostel		
Airport (nearest)	Location:	Rajiv Gandhi International Airport, Hyderabad	Distance from campus/ accommodation: 26 kms
Batch Size	Minimum participation = 10	Maximum participation = 20	

Study tour	**Type of visit**	**Places to visit (with location)**	**No. of days**
	Educational		
	Cultural/ Heritage	Chowmahalla Palace, Salar Jung Museum, Charminar, Birla Planetarium, Golkonda Fort, Hyderabad	4

2. Course Details

Aim & Objective	To create mineral prospectivity map using geological, geochemical, geophysical and remotely sensed datasets on GIS platform for targeting mineral deposit and estimation of resource.
Mode of Evaluation	Project Work and Presentation
Education Qualification	Graduate in any subject in Earth Science (Geology, Geophysics, Hydrogeology, Environmental Science, Geography, Surveying, etc.)
Work & Experience	5 Years
Target Group	Scientists, Surveyors, Teachers, Technicians, etc. dealing with Geoscientific Studies / Research on Earth Resource & Utility Management
Medium of Instruction	English
Mode of Teaching	Physical
Training Centre	Geological Survey of India Training Institute, Hyderabad
Funding	MEA

COURSE OVERVIEW

Integration and modelling of geological, topographic, geochemical, geophysical and remotely sensed data provide multidimensional insight to target mineralisation. The present course was designed to develop procedures for interpretation, interpolation and modeling of geospatial data (geology, geochemical, geophysical & remotely sensed data) using Knowledge driven methods like Boolean Logic, Index Overlay, Fuzzy logic. The course includes an in-depth analysis of the procedures of detecting geochemical anomaly using classical statistics and Geostatistical methods.

COURSE CONTENT

- **Processing and interpretation of satellite imageries (02 days)**: Role of Remote sensing in mineral exploration, Mineral Index maps, Processing of Remotely-sensed data and alteration zone mapping using multi-band RS.
- **Processing and interpretation of geological data (02days)**: Fundamentals of map projection and applying GIS techniques to geological mapping. Creation of vector files, editing, adding attributes etc in GIS environment. Creating, orienting of structural symbols.
- **Processing and interpretation of geochemical data (05 days):** Statistical treatment of the data for Geochemical Anomaly Detection: Univariate, Bivariate (Correlation & regression analysis) and Multivariate analysis (Principal Component Analysis, Cluster Analysis & Factor Analysis), Exploratory Data Analysis and detection of Geochemical Anomalies using Geostatistical analysis. Concept of interpolation and contouring of anomalies based on the threshold arrived at using the statistical techniques. Concept of Stationary and Regionalized Variables in Geostatistics, Experimental Variogram and Variogram modelling and interpolation techniques and error estimation in prediction using Kriging.
- **Processing and interpretation of geophysical data (04 days)**: Basic corrections such as drift, latitude, elevation, and terrain effects, calculation of gravity anomaly, gridding and contouring techniques, data enhancement methods etc.
- **Integrated approach to Mineral Prospecting (03 days):** Creation of factor maps (geology, geochemical, geophysical & remotely sensed data) in GIS platform, mineral prospectivity mapping using Boolean Logic, multi class Index Overlay and Fuzzy logic methods.
- **Resource Estimation (05 days)**: geostatistical techniques, resource estimation methods, and 3-D modeling using SURPAC.
- **Project work & Presentation**

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