Course Name   **: Three years Diploma in Mining Engineering**
Year   **: Second**
Subject Title   **: Application of GIS and Auto CAD in Mining**
Subject Code   **: M214**

Teaching and Examination Scheme:

Teaching Scheme*			Examination Scheme					
L	T	P	Full Marks	External Exam Marks	Internal Exam Marks	External Pas Marks	Total Pass Marks	Duration of External Exams
Practical (MI214)		**2**	**100**	**80**	**20**		**40**	4 hrs

        *****Duration of year is considered 28 weeks**

        To give emphasis on scientific and systematic exploitation of coal / minerals and to ensure sustainability of the resources, mining industry has realised the importance of technologies such as, GIS and Auto CAD for mining.

        Use of GIS for mining has brought about a revolution by ensuring cost efficient and detailed studies of the concerned area. GIS for mining help in creation of maps that are an amalgamation of all the information regarding the concerned area.

        Further, a system can be design to improve mine production efficiency, provide data query, information analysis and technical decision support for mine. It can be a GIS integrated system based on AutoCAD that can support image-text interactive queries and automatic drawing.

        For this a basic knowledge of GIS software and Auto CAD software is required.

Course Outcomes:

After undergoing the course of study the student shall be able to

1. **Topographical & Physiographical mapping**
2. **Mineral mapping to identify potential mineral zones**
3. **Geological database creation**
4. **Map updation for mineral exploration**
5. **Surface mapping**
6. **Data Analysis and Report Generation**
7. **Assist in the preparation of blueprints and other engineering plans**
8. **Create precise 2- and 3-dimensional drawings**

Suggestive Works:

Demonstration and Concept building: Introduction to GIS, Hardware and Software requirements, Scanning of maps, Printing of maps, Geographic Data, Spatial Data, Non-spatial Data input

1. Map Scale: Type and conversion, Vertical Exaggeration, Enlargement and reduction
2. Map Projection: Concept, Classification, Polyconic Projection, Mercator Projection
3. Representation of Statistical Data: Choropleths, Isopleths dots unimodel, two dimensional and 3 dimensional diagrams
4. Relief Representation Techniques: Profile identification and representation of land forms from toposheets
5. Demonstration of Raster and Vector model for representing geographic features using GIS
6. Demonstration of attributes and spatial data in GIS
7. Preparation of Topographical sheet using GIS
8. Preparation of Physiographical mapusing GIS
9. Creation of geological database using GIS
10. Surface mapping using GIS
11. Data Analysis and Report Generation
12. Demonstration of CAD techniques for drawing
13. Draw rectangles and circles with cross-hatching and automatic dimensioning using Auto CAD Software
14. Demonstration of used of AutoCAD in mine design
15. Demonstration of common features for manipulation of 3D drawing in CAD
16. Preparation of CAD generated drawing

STRATEGY OF IMPLEMENTATION:

Conducting practical, Industrial visits, seminars, group discussion, and assignment on different topics shall complete the curriculum for the subject.

REFERENCE BOOKS:

Author	Title	Publisher
RL Singh	Elements of Practical Geography	Kalyani Publishers.
BG Tamaskar & VM Deshmukh	Geographical Interpretation of Indian Topographical Maps	Orient Longman Ltd.
FE Croxton, DJ Cowden & S Klein	Applied General Statistics	Practice Hill India
K Ramamurti	Map Interpretation	Racks Printer
KK Gupta & VC Tyagi	Working with Maps	Survey of India
	Understanding Map Projection	GIS by ESRI, 2003-2004, USA