

GUJARAT TECHNOLOGICAL UNIVERSITY

BRANCH NAME: Mining Engineering

SUBJECT NAME: MINE PLANNING

SUBJECT CODE: 2172201

B.E. 7th SEMESTER

Type of course: Mining

Rationale:

The course is designed to help the student in understanding the different approaches to design a mine depending upon different geographical and topographical conditions and to select a suitable methods of working for exploitation of ore body economically and environment friendly. This course is helpful in grasping process of mine planning and also to gain knowledge about the various technical legal and economical issues to be considered in mine planning.

Teaching and Examination Scheme:

Teaching Scheme			Credits C	Examination Marks						Total Marks
L	T	P		Theory Marks			Practical Marks			
				ESE (E)	PA (M)		ESE (V)		PA (I)	
		PA	ALA		ESE	OEP				
4	0	2	6	70	20	10	20	10	20	150

Content:

Sr. No.	Content	Total Hrs	% Weightage
1	Introduction : Mine planning and its components, role of planning in mining ventures; technical information for mine planning.	6	10 %
2	Mine Economics : Mineral inventory and ore reserves and its estimation. The basis difference cut off grade, its determination. Grade Tonnage curves and their computation.	8	14 %
3	Surface Mine Planning : Surface Mine Planning : Bench geometry and mine layouts, planning steps; determination of mine size and Taylor's mine life rule; ultimate pit configuration; mining programme; haul road design.	10	20 %
4	Underground Mine Planning: Mining system and sub-systems; optimal geometrical size of a mine; planning and scheduling of production.	8	14 %

5	Size of a mine : Determination of optimum. Size of mine, life of mine, rate of production and mining losses, Optimisation of mine design on economic considerations.	10	20 %
6	Feasibility study : Its functions and preparation of feasibility report for metallic and Non-metallic minerals.	8	12 %
7	Mine Closure Planning : Various legal aspects of mine closure planning. Its advantages and amendments. Guide lines from ministry of environment and forest. Under the guidance of subject teacher preparation of a detailed project report of any mine visited by the student and submit it in department.	6	10 %

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
64 %	18 %	12 %	2 %	2 %	2 %

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Reference Books:

Sr. No.	Author	Title of Books	Publication
1	R.D.Singh	Principals and practices of Modern coal Mining	New Age International (P) Ltd
2	R.T.Deshmukh	Advance Coal Mining	Denett and Co, Nagpur
3	V.S.Vorobzer	Advance Coal Mining	Mir Publication
4	Hartman, Howard L.	Introductory to Mining Engineering	John Wiley and Sons Publication, New Delhi
5	Samir Kumar Das	Advance mining	Lovely Prakashan, Dhanbad
6	Deshmukh, D.J.	Elements of mining	Denett and Co, Nagpur

Course Outcome:

After learning the course the students should be able to:

- i. Prepare and design a mine plan depending upon various site conditions.
- ii. Select suitable mining methods depending upon the economical conditions.
- iii. Explain various technical parameters related with mine planning.
- iv. Follow the environment friendly and economic working procedure for mining.

List of Experiments:

Sr. No	Practical /Exercise	Approx. Hours Required
1	Determine Cut off grade and feasibility of a given surface mine project.	4
2	Analyze ore reserve estimation techniques for various conditions	4
3	Design a layout of a surface mine project.	4
4	Design a layout of a underground mine project.	4
5	Design a haul road layout depending upon various technical parameters.	4
6	Evaluation of Size of a mine with respect to optimum length and width based on some basic assumptions.	4
7	Evaluation of life of a mine with respect to optimum mechanization based on some basic assumptions.	4
Total		28

Major Equipment:

- i. Various mining models.
- ii. Various charts for Production system, transportation system.

List of Open Source Software/learning website:

- i. www.researchgate.net
- ii. www.min.eng.com
- iii. www.journal.elsevier.com
- iv. www.mdpi.com/journal/mineral

ACTIVE LEARNING ASSIGNMENTS: Preparation of power-point slides, which include videos, animations, pictures, graphics for better understanding theory and practical work – The faculty will allocate chapters/ parts of chapters to groups of students so that the entire syllabus to be covered. The power-point slides should be put up on the web-site of the College/ Institute, along with the names of the students of the group, the name of the faculty, Department and College on the first slide. The best three works should submit to GTU.