

GUJARAT TECHNOLOGICAL UNIVERSITY

MINING ENGINEERING UNDERGROUND COAL MINING SUBJECT CODE: 2515506 B.E. 5th SEMESTER

Type of course: Undergraduate

Prerequisite: NIL

Rationale:

The course is designed to help the student in understanding the different coal mining methods, their applicability conditions, merits and demerits, various stowing methods, ventilation and transportation system. This course is helpful to select suitable and economical method of coal mining and also to gain knowledge about the various difficulties arise during the workings of coal mine.

Teaching and Examination Scheme:

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

Content:

Sr. No.	Content	Total Hrs	% Weightage
1	Stratified deposits, their origin and distribution, Characteristics of roofs, Floors and associated rocks.	08	14
2	Factors Influencing Choice of Methods : Classification of mining, Systems their relative and application, Layout and development of mines, Mechanized development layout, Type of machinery, personnel, cycle of operation.	12	20
3	Details of Board and Pillar method size of pillars and headings, Panel system application, Size of panels, Barrier and preparatory stoppings, Working of panels, Pillar extraction and safety, Room and Pillar, Method of working.	14	23
4	Longwall system of workings, Advancing and retreating methods, Development and maintenance of longwall faces, Mechanization, Layout of workings for the required outputs, length and direction of faces, Size of gates and their maintenance, Organization on a longwall face.	14	23
5	Stowing: Principle, Method of stowing hand packing (Packwalls) Mechanical, Pneumatic and hydraulic stowing their merits, demerits and applicability, Collection and preparation of materials, Transport, handling and storage of material on surface and underground face arrangements.	12	20

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
12	15	18	09	09	07

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:

1. Elements of Mining Tech (Vol-I), D. J. Deshmukh.
2. Advance coal Mining Tech, Samir kumar Das.
3. Advance coal Mining, B. Singh.
4. U M S

Course Outcome:

After learning the course the students should be able to:

The course content should be taught and implemented with the aim to develop different types of skills leading to the achievement of the following competencies.

- Select suitable underground mining method of coal.
- Design ventilation and transportation circuits.
- Implement correct remedial action for unsafe operation.

List of Experiments:

1. Study & Layout of a board & pillar Method of working.
2. Determination of size of panel in board and pillar method.
3. Determination of Percentage extraction of coal in a development area.
4. Study & layout of longwall Method of working.
5. Determination of size of panel in longwall method of mining.
6. Study of Stowing Organization system used in mines.

Design based Problems (DP)/Open Ended Problem:

Visit to an underground coal mine to study various underground coal mining methods.

Major Equipment:

1. Mining Models.
2. Various charts of ventilation, transportation system and stowing operation.

List of Open Source Software/learning website:

1. [http://en.wikipedia.org/wiki/Underground_mining_\(soft_rock\)](http://en.wikipedia.org/wiki/Underground_mining_(soft_rock))
2. <http://scienceandtech.cmpdi.co.in/PDF%20Files/Mining%20Methods.pdf>
3. http://en.wikipedia.org/wiki/Longwall_mining
4. <http://www.slideshare.net/sankarsulimella/pillar-design-in-coal-mines>
5. http://www.undergroundcoal.com.au/fundamentals/06_overview.aspx

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.