



GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering
SubjectCode: 3142201

MINING MACHINERY-I
B.E. 4th SEMESTER

Type of course: Under Graduate level

Prerequisite: Zeal to learn the subject

Rationale:

The course mining machinery is designed to improve knowledge about different kind of machineries used in underground &/or surface mine working. It is helpful for students to use gained knowledge for selecting suitable machinery for better transportation & in turn, can improve mine output. This course aims to provide domain knowledge of major machinery required for carrying out mining operations effectively.

Teaching and Examination Scheme:

TeachingScheme			Credits C	ExaminationMarks				Total Marks
L	T	P		TheoryMarks		PracticalMarks		
				ESE (E)	PA(M)	ESE (V)	PA (I)	
4	0	2	5	70	30	30	20	150

Content:

Sr. No.	Topics	Teaching Hrs.	Module Weightage
1.	Compressed Air : Comparison with other sources of power. Air compressors – types, construction, installation and maintenance. Compressed air transmission and distribution, compressed air drills, pneumatic picks, air motors and other compressed air equipment.	12	24%
2.	Aerial ropeways different types, their construction, installation operation and Maintenance, their layout including rope tensioning arrangement.	10	18%
3.	Wire ropes: Types, construction, installation, tests and uses. Rope deterioration and maintenance. Rope capels and capping.Rope Splicing and changing of rope.	09	16%
4.	Transport: Track and mine car. Haulage tracks its laying and maintenance, gauge selection. Mine tubs and cars their constructional details and attachments. Safety provisions.	09	16%
5.	Rope haulage : Different types. Their constructions, installation, maintenance and design calculations. Safety provisions.	08	13%



GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering
Subject Code: 3142201

6.	Mine Locomotives : Different types, their construction, operation, maintenance and design calculations. Safety provisions.	08	13%
----	--	----	-----

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks				
R Level	U Level	A Level	N Level	E Level
08	14	20	14	14

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate 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 Technology, D.J.Deshmukh PartIII
2. Universal Mining School- Vol.II
3. Mine Pumps, Haulage & Winding, S.Ghatak

Course Outcome:

After learning the course the student will be able to:

1. Apply the principles of compressed air which can be used as power source in mining machineries.
2. Customize appropriate media of transportation and haulage through Aerial ropeway, rope haulages & Locomotives.
3. Select appropriate wire rope as per its construction and requirements.

List of Experiments:

Following experiments are suggested for Laboratory work

Sr. No.	List of Experiments
1.	Study of air compressors.
2.	Study of constructional features of aerial ropeway.
3.	Draw and explain different types of wire ropes used in mine.
4.	Study of different types of belt & chain conveyors
5.	Draw and explain Splicing of Haulage Ropes.
6.	Constructional features of different type of rope haulage.

Important Note:

80 % From above suggested laboratory work should be covered and remaining 20 % is as per facility available at Department.

Design based Problems (DP)/Open Ended Problem:

All above performance are to be carried out in the laboratory and students will prepare experiments and note down reading and conclusion. They can prepare for calibration and compare results with existing and



GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering

Subject Code: 3142201

with alternate methods of measurements. At least 5 open ended problems are proposed for better understanding the subject and to apply real life application. The projects are listed below:

1. Cycle of operation of different types of machinery.
2. Comparison of various rope haulages.
3. Design and prepare different haulage track layout.

Major Equipment:

1. Working model of different types of transportation machinery.
2. Rope slicing model.
3. Rope capel models.
4. Rope haulage layouts.

List of Open Source Software/learning website:

1. <http://www.joy.com/>
2. [http://en.wikipedia.org/wiki/Underground_mining_\(hard_rock\)](http://en.wikipedia.org/wiki/Underground_mining_(hard_rock))
3. <http://www.mtu-online.com/mtu/applications/mining/undergroundmining-machines/>
4. <http://www.greatmining.com/Underground-Mining.html>
5. YouTube