GUJARAT TECHNOLOGICAL UNIVERSITY

MINING ENGINEERING
MINING MACHINERY II
SUBJECT CODE: 2152201
B.E. 5th SEMESTER

Type of course: Undergraduate

Prerequisite: NA

Rationale: The mining engineers are generally responsible for the mine developments, mining activities supervision etc. In this process they have to use different machines and hence are expected to know about all types of machinery used in mining industries and their applications, operational parameters, safety features etc. The course provide students basic knowledge and skill about various types of ropes ,winding system, u/g machineries, loading and hauling machine, hoisting machine and various safety devices used in mines their installation operation and safety feature of all the machines.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks						Total Marks
				Theory Marks			Practical Marks			
L	T	P	C	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	Winding : Shaft fittings and head gear design.	06	10
2	**Winding System :** Different types, Mechanical and electrical braking, Ward Leonard control, Automatic winding. Winding drums: Types, their construction and duty cycles, Detaching hooks, Cages, Skips and suspension gear, Rigid and rope guides, Methods of counter balancing loads, Multi ropewinding, Winding from different horizons, Design calculation for different types of winding system, Safety devices, Signaling Safety regulations different signaling system in mines.	14	22
3	**Mineral Handing :** Layouts of pit-top and pit-bottom, Details of banking, Mineral handling and screening equipments, Creepers, Tipplers, Layouts of railways siding of mines.	10	17
4	**Mechanics of Coal Cutting :** Workability of Coal, Efficiency of coal cutting equipments, Design of equipments, Selection and application of machinery.	10	17
5	**Face Loaders for Coal Mines:** Construction features, Principal types, Choice of loaders, Operation and maintenance, Layout of faces for working with power loaders under	10	17

	varied condition.		
6	**Cutter Loaders:** Coal Ploughs and continuous Miners: Principles of operation, construction features, theirsuitability, their choice, operation and maintenance.	**10**	**17**

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
12	**15**	**15**	**09**	**11**	**08**

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 Technology (Vol- II, III), 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 curriculum should be implemented with the aim to develop required skills so that student is able to acquire following competency.

1. Supervise appropriate and safe use and maintenance of different mining machinery.

List of Experiments:

1. Draw and explain Winding Drum.
2. Draw and explain Winding Engine Brakes.
3. Draw and explain Safety Hooks.
4. Draw and explain different types of Pit Top & Bottom Circuits for Cage windings.
5. Draw and explain constructional features of Coal Plough.
6. Draw and explain constructional features of Continuous Miner

Design based Problems (DP)/Open Ended Problem:

Visit to a mines and study the operation and maintenance of mining machineries.

Major Equipment:

1. Models of various machines.

2. Working models of all safety devices

List of Open Source Software/learning website:

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

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.