GUJARAT TECHNOLOGICAL UNIVERSITY

BRANCH NAME: Mining Engineering
SUBJECT NAME: Mine Electrical Engineering
SUBJECT CODE: 2162208
B.E. 6th SEMESTER

Type of course: Mining

Rationale:

The degree holders are responsible to take decisions about maintenance and application of various electrical appliances in mines suitable for a particular point and purpose. So that effective electric supply should be maintain in mines. This subject provides them basic knowledge of cables used in mines, earthing practices as well as operations and maintenance of various electrical instruments and general electricity rules as applied to mines.

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	**Surface sub station :** Transmission lines from Power Company and Distribution up to mining areas. Surface and underground substation for underground mines with distribution of power. Substation and distribution of power in surface mines.	**10**	**20 %**
2	**Principle of motor and generator.** General Principle of operation of motor and generator system with constructional features. Three phase power generation system its importance and use.	**10**	**20 %**
3	**Electrical appliances used in Mines** General constructional and safety features of: Gate end box, pillar switch, Drill panel and circuit Breaker.	**10**	**20%**

4	**Cables and Earthing Practice:** Types of cables, Construction and Applicability, safety Features. Type of earthing used in mines, Main features, applicability and Construction.	**10**	**20 %**
5	Flame proof enclosures their Constructional and safety features. Intrinsically safety apparatus, their Main features. Haulage and shaft signaling system. Use of pilot circuit their advantage and applicability conditions.	**10**	**10 %**
6	**Indian Electricity Rules** Terms and definitions. Voltage limits.	**6**	**10 %**

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
62 %	**20 %**	**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.

List of Experiments:

S. No.	**Practical/Exercise**	**Approx. Hrs.**
1	Prepare outline diagrams of Surface & U/g substation.	4
2	Demonstrate working principal of motor and generator.	4
3	Demonstrate safety features of Gate End Box.	4
4	Demonstrate safety features of Drill panels.	4
5	Identify different specimens of mining, Cables and demonstrate their features.	4
6	Demonstrate various earthing practice used in Mining industries.	4
7	Demonstrate Haulage and shaft signaling system.	4
	Total	**28**

Reference Books :

Sr. No.	Title of Books	Author	Publication
1	U.M.S.	-	Lovely Prakashan
2	Mine Electrical Engg	Dash	Lovely Prakashan
3	Mine Electrcal	Nil K Dutta	Lovely Prakashan
4	Indian Electricity Rules	-	Lovely Prakashan

Course Outcome:

After learning the course the students should be able to:

i. Explain and draw layout of power distribution in a surface mine.
ii. Illustrate construction and safety features of electrical appliances used in mines.
iii. Describe safety standards for using various equipment safely in mines.

Major Equipment:

i. Models.

List of Open Source Software/learning website:

i. Wikipedia.
ii. www.youtube.com
iii. www.novamining.com

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.