

GUJARAT TECHNOLOGICAL UNIVERSITY

MINING ENGINEERING UNDERGROUND SPACE TECHNOLOGY SUBJECT CODE: 2182206 B.E. 6th SEMESTER

Type of course: Undergraduate Level

Prerequisite: Zeal to learn Subject

Rationale:

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			
3	0	0	3	70	20	10	0	0	0	100

Content:

Sr. No.	Content	Total Hrs	% Weightage
1	Need for underground space Storage of materials, defense facilities including civil defence shelters. Nuclear waste Disposal.	3	10
2	Geo- engineering Investigations: Preparing sub-surface geological x-section, geo-radar use and data analysis for shallow tunnels. Physio-mechanical properties and collection of rock mechanical data.	4	12
3	Planning & Design: Determination of appropriate size and shape. Design of opening in rocks with the help of filed data, instrumentation and monitoring, Numerical modeling to assess the stability.	4	12
4	Underground Storage: Storage for petroleum, storage technique, ground water requirements, water curtain system, types of storage, advantages and disadvantages, global information about oil storage, selected case histories.	5	15
5	Large Caverns: Dimensioning of the cavern, study of in situ state of stress and stability of side walls, Effect of situ stress in deciding the axis of cavern. Excavation for shallow and deep tunnels and caverns.	6	20
6	Shield tunneling, earth pressure balancing shields, types of shields and selection. Excavation sequence for large cavern, machines for excavation and muck transport, blast design and blasting technique. Support design and stabilization techniques: Design of steel supports.	6	20
7	Environmental Aspects: Analysis of exhaust fumes, standards for ventilation in traffic tunnels and other underground facilities, Design of ventilation system.	4	11

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.

Course Outcome:

After learning the course the students should be able to:

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.