

GUJARAT TECHNOLOGICAL UNIVERSITY
B. E. SEMESTER: VIII
MINING ENGINEERING

Subject Name: **UNDERGROUND SPACE TECHNOLOGY**

Sr. No	Course Content	Total Hrs.
1.	Need for underground space Storage of materials, defence facilities including civil defence shelters. Nuclear waste Disposal.	6
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.	10
3.	Planning & Design: Determination of appropriate size and shape. Design of opening in rocks with the help of field data, instrumentation and monitoring, Numerical modeling to assess the stability.	6
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.	10
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
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.	10
7.	Environmental Aspects: Analysis of exhaust fumes, standards for ventilation in traffic tunnels and other underground facilities, Design of ventilation system.	8

Text Books/ Reference Books: