GUJARAT TECHNOLOGICAL UNIVERSITY

B. E. SEMESTER: V

MINING ENGINEERING

Subject Name: **Rock Mechanics**
Subject Code: **152203**

Teaching Scheme				Evaluation Scheme		
Theory	**Tutorial**	**Practical**	**Total**	**University Exam (Theory) (E)**	**Mid Sem Exam (Theory) (M)**	**Practical (I)**
3	0	2	5	70	30	50

Sr. No.	Course content
1.	Definition, Application of Rock Mechanics.
2.	**Stress and Strain in Rock:** Analysis of stress, strain and constitutive relations in isotropic and anisotropic rock under static and dynamic loading.
3.	**Physico - mechanical Properties of Rock:** Determination of physical properties, Strengths, Strength indices and static elastic constants, Parameters influencing strength, Abrasivity and of its determination, Specific gravity, Hardness, Porosity moisture content, Permeability, Swell index, Slake durability, Thermal conductivity.
4.	Dynamic Properties of Rock and Rockmass.
5.	**Time Dependent Properties of Rock:** Creep deformation and strength behaviour, Creep test and archeological models.
6.	**Behaviour of Rockmass:** Rockmass structure, Classification in- situ elastic properties and strength determination.
7.	**Failure Criteria for Rock and Rockmass:** Mechanics of rock failure, Coulomb, Mohr and Griffith criteria, Empirical criteria.
8.	**Pre-mining State of Stress:** Sources, Methods of determination including overcoring and hydro-fracturing methods.
9.	**Physico-Mechanical Properties of Soil:** Physical properties including consistency and gradation: Classification of engineering soils, Engineering properties of soils compressibility, Consolidation, Compaction and strength.
10.	**Ground Water:** Influence of water on rock and soil behaviour, Permeability of rocks, Measurement of permeability, Ground water flow in rockmass, Measurement of water pressure.

Reference Books:

1. Rock Mechanics, B. P. Verma.
2. The elements of Mechanics of Mining Ground (Vol I & II), Dr. B. S. Verma.
3. Design Criteria for drll rigs equipments of drilling techniques, C. P. Chugh.
4. Ground Control in Mining, S. K. Sarkar.