**III Year-I Semester**
**(20CE5643) Rock Mechanics**

| Int. Marks | Ext. Marks | Total Marks | L | T | P | C |
|---|---|---|---|---|---|---|
| 30 | 70 | 100 | 3 | - | - | 3 |

**Pre- Requisites: Fundamentals of Building Materials**

**UNIT-I:**
**Introduction and Classification of Rocks**: Development of Rock Mechanics: Applications of Rock Mechanics – Rock Vs. Soil: Engineering Classification of intact rock and fissured rocks: Classification based on Structural features – Rock quality Designation Number and Velocity Ratio Methods.

**UNIT-II:**
**Strength and Deformation Behavior of Rocks and Failure Theories**: Typical Stress – Strain Curves – Static and Creep Test; Strength of rock – Unconfined Shear Strength and Triaxial Shear Strength of Rocks; Creep behavior of Rocks; rock fracture and friction; Coulomb – Navier; Mohr‟s and Griffith Theory and its Modification ( General discussion only – derivation of equation not included.)

**UNIT-III:**
**Laboratory Testing of Rock Samples** – Factors affecting test results sampling procedure and preparation of specimens; Tensile Tests – Direct, Indirect and Flexural tests; Uniaxial compression test; Unconfined and Triaxial shear tests; Determination of Elastic constants – Pulse generation and Resonant Frequency of a vibrating bar methods.

**UNIT-IV:**
**In- Situ Testing of Rock masses** Plate –bearing test, Pressure Tunnel test; Flat Jack Test; Permeability of Rock and rock masses; Pore water pressure in rocks.

**UNIT-V:**
**Methods of Improving the Properties of Rock Masses** – Pressure Grouting and Rock bolting.- - Design of simple – Openings in competent rocks; laminated rocks and rocks containing planes of weakness. (Distribution of stresses around simple openings suction only without derivation)

**Course Outcomes:**

| S.No | Course Outcomes | BTL |
|---|---|---|
| 1 | Classify rock mass based on field investigation data | L2 |
| 2 | Select the rock strength parameters for design | L5 |
| 3 | Suggest suitable tests on rocks for intended purpose | L5 |
| 4 | Design suitable rock important techniques | L4 |
| 5 | Know the methods of improving rock properties | L2 |

**Reference Books:**

1. Jaegar, J.C., and Cook, N.G.W. – Fundamentals of Rock Mechanics
2. Stagg, K.C. and Zienkiewicz., O.C – Rock Mechanics in Engineering Practice.
3. Obert, L & Duvall, W.L. – Rock Mechanics and the Design of Structures in Rock.