J.S. University, Shikohabad

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Value Added Course

(Rock Mechanics)

Faculty of CIVIL ENGINEERING

Rock Mechanics

Learning Objective:

This Course will provide knowledge of Rock mechanics.

Duration: 30 Hours. (Theory and Practical)

Course Outcomes: -

Maximum Exposure has to be given on Practical Oriented

On successful completion of the course students will be able to:

1. Define the characteristics and the mechanical properties (strength and failure criteria) of rock mass, rock matrix and discontinuities.

2. Explain methods for in situ investigation and laboratory testing of rock matrix and discontinuities.

3. Use rock mass classification systems (RMR, Q, GSI).

4. Conduct rock slope stability analyses.

5. Analyse the stress distribution (isotropic, anisotropic) in situ and around an opening in rock (competent rock, jointed rock mass, blocky rock).

6. Propose designs of excavation supports.

Syllabus Outline

1. **Module-1**

   Classification Of Engineering Rocks –

   Introduction, Intact rock classification, Rock mass Classification. Terzaghi's, Rock load classification, Austrian classification, Deere's rock quality classification.

2. **Module-2**

   Engineering Properties And Laboratory Tests On Rocks-

   Porosity, Density, Moisture content, Degree of saturation, Co-efficient of permeability, Durability, Compressive strength,Tensile strength, Shear strength, elasticity, Plasticity Deformability.

3. **Module-3**

   Insitu Tests On Rocks-

   Necessity of Insitu test, Plate load test for deformability, Shear test, Test for internal stresses – flat Jack, pressure meter test.

4. **Module-4**

   Grouting And Rock Bolting-
   Grouting materials, Grouting operations, methods of Grouting, Mechanism of Rock Bolting, Principal of design.

5. **Module-5**

   Bearing Capacity Of Rocks-

   Bearing capacity of intact rocks, jointed rocks,IS Code methodology, Singh and Rao Method and latest methodologies.

References:-

1) "Fundamentals of Rock Mechanics" by J C Jaeger and N G W Cook
2) "Rock Mechanics and Design Structures of Rock" by Obert and W I Duvall
3) "Comprehensive Rock Mechanics" by J A Hudson
4) "Fundamentals and Applications of Rock Mechanics" by DEB DEBASIS and VERMA ABHIRAM KUMAR

(Name of Faculty)	(Name of Faculty)	(Name of Faculty)
Course Coordinator	Dean Academics	Director/Principle/Dean of Faculty/Department