Year & Sem	Course Code: CE4510	Course Name: Rock Engineering	No. of Credits: 4	L	T&PS	P
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Unit-I: Classification of Intact rock and Rock masses, Strength and modulus from classifications. Physico mechanical properties, Laboratory tests for various physical and mechanical properties.Field shear test, Deformability tests in rock mass, State of stress in the ground.

Unit-II: Insitu stress, various methods of stress measurement, Hydrofracturing technique, Flat jack technique, Overcoring technique. Underground opening in infinite medium, Elastic and elasto-plastic approach. Stress concentration for different shapes of opening, Zone of influence.

Unit-III: Failure criteria for rock and rock masses, Mohr-Coulomb Yield Criterion, Drucker-Prager Criterion,Hoek-Brown Criterion, Tensile Yield Criterion. Strength and deformability of jointed rock mass, Fracture strength of jointed rock mass.Shear strength of Rock joints, Deformability of Rock joints, Concept of joint compliance.

Unit-IV: Stability of rock slopes, Modes of failure, Plane failure, Wedge failure, Circular failure, Toppling failure. Foundation on rocks, Estimation of bearing capacity, Stress distribution in rocks, Settlement in rocks,Pile foundation in rocks.

Unit-V: Methods to improve rock mass responses, Grouting in Rocks, Rock bolting, Rock Anchors.

Unit-VI: Numerical modeling of rocks and rock masses, Application to tunnels, slopes.

References/Text Books

1. Introduction to Rock Mechanics by R.E.Goodman, John Wiley & Sons.
2. Engineering in Rocks for Slopes, Foundation and Tunnels, Editor T.Ramamurthy, Prentice Hall India Pvt. Ltd.
3. Fundamentals of Rock Mechanics, Fourth Edition, by Jaeger, Cook and Zimmerman, Blackwell Publishing.
4. Rock mechanics and the design of structures in rock, L. Obert and Wilbur I. Duvall, John Wiley & Sons, Inc.

Lecture Plan: Unit-I & -II syllabus for MID-I, Unit-III & -IV syllabus for MID-II and Unit-V & -VI syllabus for MID-III examinations.

Video Lectures (Web Links):
1.
2.
3.

Study Materials (Web Links):
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2.
3.