ADVANCED NUMERICAL MODELLING TECHNIQUES IN MINING

Code	Credit Hours
MinE-812	3-0

Course Description.

Introduction to Numerical Methods in Rock Mechanics, Practice Problems (Plane strain and plane stress, 3D Analysis, Meshing/Zoning), Numerical modelling practice (Non-linear behavior of rock mass, Numerical modeling: Good Practice, Underground excavations and Tunnel construction analysis, Axisymmetric Modeling of Post-Pillar Mining, Cemented backfill pillar performance analysis)

Textbook:

1. (2002), Numerical Methods in Rock Mechanics Volume 39.
2. G.S.P Singh, Upindra Kumar Singh, V.M.S.R Murthy, (2010), Application of Numerical Modelling for Strata Control in Mines

References Books:

1. David L. Olson, Dursun Delen, (2008), Advanced Data Mining Techniques

Pre-Requisites:

Nil

ASSESSMENT SYSTEM FOR THEORY

Quizzes	15%
Assignment	5%
Mid Terms	30%
ESE	50%

Teaching Plan

Week No	Topics	Learning Outcomes
1	Introduction	CourseOutline,objectives,teachingplan,assessmentmethod, conceptsreview
2	Numerical method for rock mechanics, Practice Problems, Numerical modelling practice	Modeling in rock engineering design, Numerical techniques for rock mechanic
3-4	Numerical method for rock	Continuum method and dis-continuum method, Explicit

	mechanics,	vs implicit approach
5-8	Practice Problems	Numerical problem solving: Plane strain and plane stress 3D Analysis Meshing/Zoning Constitutive modeling
9	**MID TERM EXAM**	
10	Numerical modelling practice	Analysis of non-linear behavior of rock mass and numerical modeling: Good Practice
11-12	Numerical modelling practice	Underground excavations and Tunnel construction analysis
13-14	Numerical modelling practice	Axisymmetric Modeling of Post-Pillar Mining
15-16	Numerical modelling practice	Cemented backfill pillar performance analysis
17	Numerical modelling practice	Stability of an open pit in jointed rockmass
18	**END SEMESTER EXAM**	