REMOTE SENSING & GEOGRAPHIC INFORMATION SYSTEMS AND MACHINE LEARNING IN MINING ENGINEERING

Code	Credit Hour
MinE-835	3-0

CourseDescription

This course covers a range of topics essential for understanding Geographic Information Systems (GIS) and Remote Sensing in the context of geological and environmental sciences. It begins with an introduction to coordinate systems and georeferencing, followed by an exploration of geodatabases and techniques for creating and editing spatial data. The course also addresses symbology and visualization in GIS, principles of cartography, and spatial analysis methods including interpolation. It delves into statistical approaches for mineral potential mapping and principles of Remote Sensing. Additionally, it covers practical aspects such as geological mapping, geohazards assessment, and the application of GIS in geotechnical engineering.

Textbook:

1. Bonham-Carter, G.F(1994), Geographic Information Systems for Geoscientists: Modelling with GIS.
2. Moon, C.J et-al (2006), Introduction to Mineral Exploration, Electronic Blackwell Science
3. Marjoribanks, R. (2010), Geological Methods in Mineral Exploration and Mining, 2nd Edition, Chapman & Hall.

ReferenceBook:

1. Prost, G.L (2014), Remote Sensing for Geoscientists: Image Analysis and Integration, 2nd Edition, Springer-Verlag Berlin Heidelberg

Prerequisites

Nil

ASSESSMENT SYSTEM FOR THEORY

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

TeachingPlan

Week No	Topics	LearningOutcomes
1	Introduction	CourseOutline,objectives,teachingplan,assessment method, conceptsreview
2-6	Foundations of GIS	Introduction to coordinate systems and geo-referencing, followed by an exploration of geo-databases and techniques for creating and editing spatial data.
6-8	Visualization in GIS	The course also addresses symbology and visualization in GIS, principles of cartography, and spatial analysis methods including interpolation.
9	**MIDTERM EXAM**	
10-13	Statistical Approaches and Practical Applications in Geotechnical Engineering	Statistical approaches for mineral potential mapping and principles of Remote Sensing. Additionally, it covers practical aspects such as geological mapping
13-17	GIS for Geohazards assessment	Geohazards assessment, and the application of GIS in geotechnical engineering.
18	**END SEMESTER EXAM**	