

Credit distribution, Eligibility and Pre-requisites of the Course

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
DSE-4 Exploration Geology (L3, P1)	4	3	0	1	12 th pass with science	Studied Earth System Science and Structural Geology, Hydrogeology or Equivalent

Learning Objectives

The course on exploration geology is intended to provide introductory knowledge of mineral exploration at different stages through geological, geochemical, geophysical, and remote sensing methods. Students will also be provided basic understanding about the estimation of reserves.

Learning outcomes

After going through this course, students will have a clear idea and knowledge about the exploration methods and tools, and their application in mineral resource exploration and exploitation.

SYLLABUS OF DSE-4

Theory (45 Hours)

UNIT – I (9 Hours)

Detailed content

Introduction to exploration geology: Definitions and different terminologies of exploration components. Basic exploration and exploitation steps or stages. Classification of mineral deposits with respect to exploration strategies. Mineral resources and their uses

UNIT – II (9Hours)

Principles of mineral exploration: Importance of mineralogy, grain size-shape and texture in exploration. Mineral identification and analytical techniques. Sampling techniques, drilling and logging. Estimation of grade in samples.

UNIT – III (9 Hours)

Detailed content

Prospecting and exploration: Surficial survey methods and applications. Geochemical survey methods and applications. Geophysical survey methods and applications. Remote sensing methods and applications

Unit – IV (9 Hours)

Detailed content

Importance of drilling and logging in exploration: Core and non-core drilling. Basic parts of drilling machine. Types of drilling techniques. Planning and location of bore holes on ground.

Unit – V (9 Hours)

Detailed content

Principles of reserve estimation: Reserves estimation methods and models. Critical geological data to be considered. Factors affecting reliability of reserve estimation and types of errors. Evaluation of sampling data: mean, median, mode, standard deviation and variance.

Practical Component- (30 Hours)

Exercises based on Evaluation of data Average grade and reserve estimation techniques. Geological cross-section and borehole problems.

Essential/Recommended readings

Moon, C.J., Whateley, M.K.G. & Evans, A.M. 2006. Introduction to Mineral Exploration, Blackwell Publishing.

Haldar, S.K., 2013. Mineral Exploration – Principles and Applications. Elsevier Publication.

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Moon, C.J., Whateley, M.K.G. & Evans, A.M. 2006. Introduction to Mineral Exploration, Blackwell Publishing.

Haldar, S.K., 2013. Mineral Exploration – Principles and Applications. Elsevier Publication.

Arogyaswami, R.P.N.(1996. Courses in Mining Geology. 4th Ed. Oxford-IBH.

Clark, G.B. 1967. Elements of Mining. 3rd Ed. John Wiley & Sons.