Discipline Specific Elective 3 DSE (12):
(i) Mineral Resources and Economics (L3, P1), (ii) Applied Stratigraphy (L3, P1), (iii) Techniques of Sample collection & processing in Geology (L3, P1)

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
DSE - 8 **Mineral Resources and Economics**	**4**	**3**	**0**	**1**	**12th pass with science**	**Studied Earth System Science and Structural Geology, Hydrogeology or Equivalent**

Learning Objectives:

- To develop an understanding of Earth's mineral resources.
- To explore their classification, distribution, and economic relevance.
- To examine mineral exploitation practices and their implications in global economic activity.
- To build awareness about policy, legal, and environmental considerations in mining and mineral economics.

Learning Outcomes:

After completing the course, students will be able to:

- Identify and classify various types of mineral resources and reserves.
- Understand the distribution of mineral deposits in India and globally, along with their economic importance.
- Explain key processes involved in mineral beneficiation and mining.
- Interpret national policies, global trends, and sustainability concerns in mineral resource management.

THEORY (45 Hours)

UNIT – I (12 Hours)

Mineral Resources: Resource and reserve definitions; mineral resources in industries; economic considerations; historical perspective and present. A brief overview of classification of mineral deposits with respect to processes of formation in relation to exploration strategies.

UNIT – II (12Hours)

Distribution of economic mineral resources: Major mineral deposits of India: reserve, grade, mineralogy and exploitation through time. Major mineral deposits of the World: reserve, grade, mineralogy and exploitation through time

UNIT – III **(11 Hours)**

Metallic, non-metallic, industrial, critical, strategic and gem minerals; Mineral beneficiation and mining.

UNIT – IV **(10 Hours)**

Mineral economics: Global metal markets and projections; National mineral policy; Mineral conservation. UNFC classification; Legal, social and environmental aspects affecting the mine cycles.

PRACTICALS **(30 Hours)**

1. Exercises related to mineral resources of India and World. Reserve estimation
2. Projection on Indian mineral resource

Essential/Recmmended readings:

Evans, A.M., 2009. Ore geology and industrial minerals: an introduction. John Wiley & Sons.

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

Exploration, Blackwell Publishing.

Chatterjee, K.K. (2004). An Introduction to Mineral Economics, New Age Publishers.

Recommended readings:

Wills, B.A. and Finch, J.A., 2015. Wills' mineral processing technology: an introduction to the practical aspects of ore treatment and mineral recovery. Butterworth-Heinemann.

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..