EGE 5301. Economic Geology

Unit – 1

Mineral resource crisis, factors controlling mineral availability, minerals and global economic patterns, future of ore deposit geology; Geology of ore deposits – classification and deposit models. Textures of ore and gangue minerals; Paragenesis, zoning; Magmatic ore deposits; Hydrothermal ore deposits – magmatic and orogenic environments, sedimentary environments; Ore deposits formed in sedimentary environments; Supergene ores and supergene overprinting of ores.

Unit – 2

Mineral law and land access: National Mineral Policy – MM (R & D) Act, 1957 – procedures for grant of mineral concessions in India; Types of land and mineral ownership in different countries; Exploration versus exploitation concessions. Mineral Economics: History and structure of the mineral industry; Profits in the mineral industry; Mineral taxation and mineral profits; Mineral commodity prices; Distribution of profits. Law of the Sea Treaty – marine mineral resources.

Unit – 3

Mineral resources and exploration; search for ore deposits and chances of success – geological, geochemical, geophysical, drilling, sampling and other field techniques; Remote sensing applications in mineral exploration; Surveying and exploration; statistical treatment of exploration data and computer applications.

Unit -4

Mining terminology; Appraisal of exploration data for mining; Mine planning and development; Life cycle assessment (LCA) method; Open-cast mining methods; Underground mining methods; Alluvial mining and quarrying.
Mine hazard and safety works; Mine monitoring; Mine reclamation.

References

- Banerjee (2001), Mineral Resources of India.
- Evans, A.M., (1980) An introduction to Ore geology, Blackwell Scientific Publications, 231p.
- Evans, A. M. (1993), Ore Geology and Industrial Minerals: an Introduction, Blackwell, 403p
- Geological Survey of India (2009), Miscellaneous publication no. 30, part-xxii: Geology and mineral resources of India,152p
- Geological Survey of India, Detailed information dossier (DID) of ores in India, (Available at GSI portal: www.portal.gsi.gov.in).
- Indian Bureau of Mines Bulletins of Mineral Information (availabile at IBM website) Ministry of Mines Annual Report 2011-12, 248p.
- Mookherjee, A., (1999), Ore Genesis- A Holistic Approach, Allied Publishers, 657p.
- Ministry of Mines (2011), Report of the working group on mineral exploration & development (other than coal & lignite) for the 12th five-year plan sub group – on survey and mineral exploration, 310p.

- Nuclear Power in India Indian Nuclear Energy, http://www.world-nuclear.org/info/inf53.html
- Prasad, U (2002), Economic Mineral Deposits, CBS Publishers, New Delhi.
- Soman, K. (2001), Geology of Kerala, GeolSoc of India, Bangalore, 335p
- Stanton, R.L., (1972), Ore Petrology, McGraw Hill Inc, 213p
- Uranium 2009: Resources, Production and Demand, (The Red Book) Nuclear Energy Agency, OECD, 452p.
- Wellmer, F.W., Dalheimer, M. and Wagner, M. (2008), Economic Evaluation in Exploration, Springer-Verlag, Berlin.
- Zoellner, T. (2009) Uranium: war, energy, and the rock that shaped the world, Viking, London, 353p.
- Arogyaswamy, R.N.P. (1980), Courses in Mining Geology, 2nd Ed., Oxford & IBH Pub. Co., New Delhi
- Arthur, W., Hawkes, H.E. and Webb, J.S. (1979), Geochemistry in Mineral Exploration, Academic Press, USA, 657p.
- Banerjee, P.K and Ghosh, S. (1997), Elements of Prospecting for Non-fuel Mineral Deposits, Allied Publishers Pvt Ltd, 320p.
- Kearey, P. and Brooks,M. (1991), An Introduction to geophysical Exploration, Blackwell scientific Publications, Musset, 272p.
- Krisch, R (2006). Groundwater Geophysics, A tool for hydrogeology, Springer – Verlag Berlin Hiedelberg.,Berlin 548 pp
- Lowrie, W (2007). Fundamentals of Geophysics, Cambridge University press, New York, 381pp.
- Mckinstry, H.E. (1947), Mining Geology, 1st Indian Ed., Asia Publishing House, New Delh
- Milsom,J (1989). Field Geophysics, A Geological Society of London Handbook, John Wiley&sons, New York.182 pp.
- Mishra D, C. (2011). Gravity and Magnetic Methods for Geological Studies,BS publications Pvt.Ltd Hyderabad 938pp.