

AG-404

Economic Geology

Credit Hours 2+1

Prerequisite: AG-309

Learning Outcomes

This course is designed to acquire the knowledge about the formation of various types of economic mineral deposits and their significance. This will help the students to understand the processes which are involved in the genesis of various ores deposits, hydrocarbons, gemstones and other industrial minerals.

Course Contents

Introduction economic minerals and rocks and their classification. Processes of formation of economic mineral deposits: magmatic segregation, hydrothermal solution, metasomatism, sedimentation, evaporation, residual and mechanical concentration and metamorphism. Relationship of mineral deposits to plate tectonic settings. Introduction of geological exploration / prospecting. Brief description of hydrocarbons, coal, gemstones, copper, lead, zinc, iron, gold, chromite, manganese, salt, gypsum, bauxite, sulphur, barite, fluorite, clays, phosphorite, building stones, industrial rocks and radioactive minerals and rocks with special reference to deposits in Pakistan.

Lab.

Identification and description of ores and industrial minerals/rocks. Grade and reserve estimation of deposits.

TEACHING – LEARNING STRATEGIES

- Lecture based examination
- Presentation/seminars
- Class discussion
- Quizzes

ASSIGNMENTS – TYPE AND NUMBER WITH CALENDAR

It is continuous assessment. The weightage of Assignments will be 25% before and after midterm assessment. It includes:

- classroom participation,
- attendance, assignments and presentation,
- homework
- attitude and behavior,
- hands-on-activities,
- short tests, quizzes etc.

ASSESSMENT AND EXAMINATIONS

Sr. No.	Elements	Weightage	Details
1.	Mid Term Assessment	35%	It takes place at the mid-point of the semester
2.	Formative Assessment	25%	It is continuous assessment. It includes: classroom participation, attendance, assignments and presentation, homework, attitude and behavior, hands-on-activities, short tests, quizzes etc.

3.	Final Assessment	40%	It takes place at the end of the semester. It is mostly in the form of a test, but owing to the nature of the course the teacher may assess their students based on term paper, research proposal development, field work and report writing etc.
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Books Recommended

1. Directory of Mineral Deposits of Pakistan, by Zaki, A., 1969. Geological survey of Pakistan.
2. Ore Deposits by Park, C.F. & macDiarmid, R.A., 1970, W.H. Freeman & Co.
3. Economic Mineral Deposits by Jenssen, M.L. & Bateman, A.M., 1972, John Wiley & Sons.
4. Mineral Prospecting Manual by Chausier, J.B., 1987, North Oxford Academic Press
5. An Introduction to ore Geology by Evans, A.M., 1987, Blackwell.
6. Atlas: Economic Mineral Deposits by Dixan, C.J. 1979, Chapman Lordin & Hall.
7. Metallogeny and Mineral Deposits of Pakistan by Kazmi, A.H. & Abbas, S.G., 2001, Orient Petroleum Inc.
8. Handbook of Exploration Geochemistry, Govett, G.J.S. (ed), 1995, Elsevier
9. Ore Deposit Geology by Edward, R.& Atkinsons, K., 1986, Chapman and Hall