



Faculty of Earth Sciences



Department of Mineral Resources & Rocks 3rd & 4th Years Program



The Geological Society
Accredited degree courses

GEOLOGICAL AND GEOCHEMICAL EXPLORATION

Course Name	Course ID	Prerequisites
<i>GEOLOGICAL AND GEOCHEMICAL EXPLORATION</i>	<i>EMR 443</i>	<i>EMR 231 / EMR 241</i>

Course Description

Introduction in principles of geological and geochemical exploration. Method of using of geological guides in exploration of various mineral deposits. Use of technical and geochemical calculations in geochemical exploration of ore and mineral deposits. Methods of planning and execution of complete exploration programs and examples. Interpretation of geochemical data and preparation of geological and geochemical exploration reports.

Course Objectives

1. Defining the basic principles and methods used in geological exploration
2. Study the different types of guides (such as mineralogical, lithological, stratigraphic guides, *etc.*) and their use in geological exploration
3. Defining the basic principles of geochemical exploration and the different methods of geochemical survey.
4. Study and understanding the behavior and method of geochemical dispersion of elements in the different environments.
5. Study the different types of geochemical dispersion aureoles, including primary, secondary, and flow dispersions and their relation to ore deposits.
6. Statistical interpretation of geochemical data to determine the areas of anomalies and calculating some geochemical parameters used in exploration such as background, anomalous value, *etc.*

General References for the Course: (Books/Journals...*etc.*)

Students in this course can read from:

1. *Geochemical Prospecting for Mineral Deposits*, by Solovov, A.P., 1987. (Kuznetsov, V.V., Trans.) (Engl. Ed.). Mir, Moscow. 288 pp.
2. *Geochemistry in Mineral Exploration, 2nd Edition*, by Rose, A.W., Hawkes, H.E., and Webb, J.S., 1987. Academic Press, London, 657pp.
3. *Mining Geology*, by McKinstry, H.E., 1948. Prentice-Hall: New York.
4. *Rock Geochemistry in Mineral Exploration*, by Govett, G.J.S., 1983. Handbook of exploration geochemistry. Elsevier Pub. Co.
5. Journal of Geochemical Exploration

List of URLs for this Course

- http://www.geolsoc.org.uk/template.cfm?name=journals_geea_home_page
- <http://www.geotech.org/>
- http://gsc.nrcan.gc.ca/geochem/model/related_research_e.php

Course Outcome

By the end of this course, the student should:

1. Student can be able to define the basic principles and methods used in geological exploration and the different methods of geochemical survey.
2. Student can familiarize with the different types of mineralogical, lithological, and stratigraphical guides and their use in geological exploration.
3. Student can understand the behavior and method of geochemical dispersion of elements in the different environments.
4. Student can know the different types of geochemical dispersion aureoles, including primary, secondary, and flow dispersions and their relation to ore deposits.
5. Student can be able to use the statistical treatments of the geochemical data to interpret and determine the areas of anomalies.