



Faculty of Earth Sciences



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



The Geological Society
Accredited degree courses

ISOTOPE GEOLOGY

Course Name	Course ID	Prerequisites
<i>ISOTOPE GEOLOGY</i>	<i>EMR 441</i>	<i>EMR 241</i>

Course Description

Classification of isotopes. Theory of radioactive decay and its application for age dating of igneous and metamorphic rocks. Uranium-series disequilibrium. Important examples of dating methods. Study of stable isotopes, isotopic fractionation and their applications.

Course Objectives

- 1- To Study the changes occurred as a result of radioactive decay and their applications in age dating of rocks and minerals.
- 2- To identify the genesis of some mineral deposits and rocks using different radioactive and stable isotopes.
- 3- To define isotopic fractionation and discover the fundamental reasons for its occurrence.

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

- 1- Faure G. (1986): Principles of Isotope Geology, John Wiley and Sons, 589p
- 2- Ivanovich M. and Harmon, R. S. (1992): Uranium Series Disequilibrium: Application to environmental problems, (2nd Ed.: Oxford, Oxford University Press), 571p
- 3- Attendorn H.-G. and Bowen R. N. C. (1996) Radioactive and Stable Isotope Geology, Chapman & Hall, 522p.
- 4- Geochimica et. Cosmochimica Acta (Journal)
- 5- Chemical Geology, Isotope Geosciences (Journal)
- 6- Applied Radiation and Isotopes (Journal)

List of URLs for this Course

- <http://www.onafarawayday.com/Radiogenic/>
- http://www.sci.uidaho.edu/geol423/topic_6.htm

Course Outcome

By the end of this course, the students should be able to:

- 1- Student can know the relation of Isotope Geology to other subjects of geosciences.
- 2- Student can be familiar with the changes occurred as a result of radioactive decay.
- 3- Student can be familiar with the reasons of disequilibrium in radioactive decay series.
- 4- Student can know the important applications of uranium-series disequilibrium.
- 5- Student can know the applications of radioactive decay in age dating of rocks and minerals.
- 6- Student can be able to identify the genesis of some mineral deposits and rocks using radioactive and stable isotopes.
- 7- Student can be acquainted with isotopic fractionation and the fundamental reasons for its occurrence.
- 8- Student can be able to work together in groups.