



THE FEDERAL UNIVERSITY OF TECHNOLOGY, AKURE

Department of Applied Geology

AGY302 – Introductory Geochemistry

COURSE PARTICULARS

Course Code: AGY302

Course Title: Introductory Geochemistry

No. of Units: 3

Course Duration: Three hours of theory per week for 15 weeks.

Status: Compulsory

Prerequisite: AGY201, CHE102, CHE202.

COURSE INSTRUCTORS

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COURSE DESCRIPTION

Abundance, classification and distribution of elements in the cosmic system, lithosphere, hydrosphere and atmosphere. Geochemistry of different rock types and mineral deposits. Weathering of major rock forming minerals and soil formation. Geochemical mobility. Geochemical cycles of some major elements. Association of elements. Principles and methods of exploration geochemistry and geochemical analysis. Isotope geochemistry:- principles of geochronology:- Rb/Sr, K/Ar and U/Pb dating methods Stable isotopes. Introduction to the use of relevant computer packages for data analyses and graphical presentation.

COURSE OBJECTIVES

the objectives of this course are to:

- introduce students to the chemical composition of composition of the solar system, earth and their distribution.
- processes that are responsible for the re-distribution of the elements in the upper part of the crust.
- introduce students to different methods of radiometric dating and geochemical exploration.

COURSE LEARNING OUTCOMES / COMPETENCIES

Upon successful completion of this course, the student will be able to:

(Knowledge based)

- understand how chemical processes have affected the earth.

(Skills)

- Students will be equipped with geochemical mapping and dating techniques.

GRADING SYSTEM FOR THE COURSE

This course will be graded as follows:

Tests and Assignments 30%

Theory Examination 70%

TOTAL **100%**

GENERAL INSTRUCTIONS

Attendance: Attendance is must for lectures. Candidate(s) who did not meet the minimum attendance will be disallowed from writing exams.

Academic Integrity: Violations of academic integrity, including dishonesty in assignments, examinations, or other academic performances are prohibited. You are not allowed to make copies of another person's work and submit it as your own; that is plagiarism. All cases of academic dishonesty will be reported to the University Management for appropriate sanctions in accordance with the guidelines for handling students' misconduct as spelt out in the Students' Handbook.

Assignments & Tests: Students are expected to submit assignments as scheduled. Failure to submit an assignment as at when due will earn you zero for that assignment. Only under extenuating circumstances, for which a student has notified any of the instructors in advance, will late submission of assignments be permitted. Two tests are normally conducted:- one impromptu and the other announced.

Code of Conduct in Lecture Rooms and Laboratories: Students should turn off their cell phones during lectures. Students are prohibited from engaging in other activities (such as texting, watching videos, eating *etc.*) during lectures. Food and drinks are not permitted in the laboratories. Students who do not dressed decently will be disallowed from the class.

READING LIST

¹ Mason (1975). *Principles of geochemistry*. John Wiley & Sons.

¹Brown, G.C. and Musset, A.E. (1981): *The Inaccessible Earth*. George Allen & Unwin, London

Henderson, P. (1982). *Inorganic geochemistry*. Pergamon Press

¹Available in the University Library.

COURSE OUTLINE

Week	Topic	Remarks
1	Introduction and Course Overview	During this first class, the expectation of the students from the course will also be discussed.
2	Abundance, classification and distribution of elements in the cosmic systems	Elemental compositions of the Sun, Moon and Meteorites will be discussed.
3 & 4	Abundance, classification and distribution of elements in Earth.	Discussions will focus on elemental compositions of the lithosphere, hydrosphere and atmosphere.
5 & 6	Geochemistry of different rock types and mineral deposits	Chemical compositions of selected rocks and mineral deposits will be emphasized.
7	Weathering of major rock forming minerals and soil formation	Students will be taught the basic processes of chemical weathering of silicate minerals as the basis for soil formation. Soil profile will equally be discussed.
8	Geochemical mobility, Geochemical cycles of some major elements. Association of elements	<p>Movement of elements in the earth and factors that contributed to this will be discussed. Specific examples geochemical cycles will be emphasized.</p> <p>Mid Semester Test</p>

9	Association of elements	The four major association: siderophile, chalcophile, lithophile and atmophile will be discussed.
10 & 11	Principles and methods of exploration geochemistry and geochemical analysis	Discussion will focus on geochemical exploration techniques, sampling methods, preparation of samples for analysis and analytical methods. Interpretation of results using computer packages.
12 & 13	Isotope geochemistry	Emphasis will be on general principles of radiometric dating. Selected methods will be discussed
14	Stable isotopes.	Discussion will be on O, H, S and C; and their importance in geochemistry.
15	Revision	