**GEL 325 INTRODUCTION TO GEOCHEMISTRY 3 UNITS**

BTech (Geology)

COURSE OUTLINE

**Course Lecturer**: Dr. Nuhu Musa **WAZIRI & Dr. W.G. Akande**

Geology Department

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Office: Located at the Geology Department

Contact Hours: 10.00 am – 3.00 pm Monday to Friday

**Objectives of the Course**: This first course in geochemistry is aimed at creating a bridge between the topics students have taken in chemistry during their previous semesters and geology. It covers the use of chemical principles to explain problems relating to the planet earth and its different spheres (i.e. lithosphere, hydrosphere, biosphere and atmosphere) and their interactions on the one hand and the entire solar system on the other. The distribution of chemical elements in minerals, rocks, sediments and water and the processes or laws governing such distribution is of great significance in understanding the formation and evolution of the earth and other planets over geologic time. As the demand for new natural resources, especially, the mineral types continues, understanding the geochemistry of different rock types and possible mineralization that may be found in each is a worthwhile geosciences knowledge.

**Lecturer Delivery**: This course will be delivered mainly through lecturers, involving PowerPoint presentation and class discussion, supplemented with take home assignments and readings.

**Evaluation Methods**: Evaluation will be carried out continuously during the semester in the form of assignments, quiz, announced test and finally the end of semester examination.

**Lecturer Periods**: Thursdays 12-1pm, Fridays 10.00 am-12.00 noon.

**Lecture Venue**: GC3 within the Geology Complex at the Bosso Campus.

**Course Contents**

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| **Week** | **Topics** |
| 1 | Introduction and review of basic chemical concepts, Definition and branches of geochemistry |
| 2 | Origin, Abundance and classification of elements in different spheres (lithosphere, hydrosphere, atmosphere) and meteorites |
| 3 | Geochemical environments and the concept of geochemical association |
| 4 | Geochemical mobility and dispersion: primary and secondary dispersion patterns and their geological implications |
| 5 | **Continuous assessment test**  Geochemistry of igneous rocks from partial melting, through magma differentiation and fractional crystallization to the solid rock |
| 6 | Geochemistry of metamorphic and sedimentary rocks: the transformation story |
| 7 | Aqueous geochemistry: element distribution in the earth’s hydrosphere and its implication |
| 8 | Introduction to stable and radioactive isotope geochemistry |
| 9 | Examination |

**Reference Texts:**

1.Francis Albarede 2009 Geochemistry: An Introduction

2. Kula C. Misra 2012 Geochemistry: Principles and Applications

3. Rankama and Sahama 1950: Geochemistry

4. Krauskopf and Bird 2003 Principles and Applications of Geochemistry

5. W.M. White 2005 Geochemistry [Online] www.geo.cornell.edu/geology/classes/geo455