



THE FEDERAL UNIVERSITY OF TECHNOLOGY, AKURE

Department of Applied Geology

AGY405–Economic Geology

COURSE PARTICULARS

Course Code: AGY405

Course Title: Economic Geology

No. of Units: 3

Course Duration: Two hours of theory and three hours of practical per week for 15 weeks.

Status: Compulsory

Prerequisite: AGY203, AGY208, AGY302, AGY312

COURSE INSTRUCTORS

Mr. M. O. Adepoju

Room 112, SEMS Building,

Dept. of Applied Geology,

Federal University of Technology, Akure, Nigeria.

Phone: +2348034722855

Email: moadepoju@futa.edu.ng; moadepoju@gmail.com

COURSE DESCRIPTION

This is an advanced course taught in the penultimate year. It requires good background in other courses like Structural Geology, Tectonics, Rock Forming Processes, Geochemistry and Geophysics. The course is divided into two parts. Part I deals with the fundamental principles of the genesis of ore minerals. Part II handles the classic examples of the world-class ore mineral deposits covering all the metals. The major topics of this course are:

- Types and Genesis of Orebodies
- Spatial Distribution of Orebodies
- Mineral Economics
- World-Class Ore Deposits

COURSE OBJECTIVES

The objectives of this course are to:

- familiarize with common terminologies in economic geology and mineral exploration,
- understand why certain parts of the earth are mineralized by introducing mineralisation controls,
- introduce the screens for profitability in mining ventures and mineral markets, and
- teach the various types of the major ore deposits and their impact on the economy of the countries where they occur.

COURSE LEARNING OUTCOMES / COMPETENCIES

On completion of this course, students should comprehend the wide variety of metalliferous ore-forming processes.

Students should have developed skills in the following areas

- interpreting ore deposits,
- exploration techniques based on ore-forming processes, and
- communication.

GRADING SYSTEM FOR THE COURSE

The presentation of this subject and the assessment is designed to encourage continuous and collaborative learning, maximise feedback and interaction, and reduce the weighting of the final theory exam. Worksheets from the practical sessions are to be submitted after each practical session. Two assignments on a variety of subjects are to be submitted during the semester.

Theory Exam: 40% Two-hour theory exam, including all topics covered in the lectures;

Prac. Exam: 20% One-hour exam, including hand-specimen, thin section and polished block identification of ore and gangue minerals plus associated rocks; Assignments: 20% Two assignments of up to 1000 words each to be submitted during the semester. (i.e., each worth 10%); Class Test: 20% One-hour test will be conducted upon returning from the mid-semester break.

GENERAL INSTRUCTIONS

Attendance: It is expected that every student will be in class for lectures and also participate in all practical exercises. Attendance records will be kept and used to determine each person's (minimum 65 % attendance) qualification to sit for the final examination. In case of illness or other unavoidable cause of absence, the student must communicate as soon as possible with the instructor, indicating the reason for the absence.

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 and Group Work: 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 the instructor in advance, will late submission of assignments be permitted.

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, tateate, baby nursing, etc.) during lectures. Food and drinks are not permitted in the laboratories.

READING LIST

¹ Evans, A.M. 2000. Ore Geology and Industrial Minerals, An Introduction; Blackwell Science.

¹ Evans, A.M. 1980. An Introduction to Ore Geology, Elsevier.

¹ Jensen, M.L. and Bateman, A.M., 1981. Economic Mineral Deposits, 3rd Edition; John Wiley, New York.

¹ Hutchison, C.S.H., 1983. Economic Mineral Deposits and their Tectonic Setting; The MacMillan Press Ltd.

Peters, W.C. 1987. Exploration and Mining Geology, 2nd Edition, John Wiley & Sons.

COURSE OUTLINE

Week	Topic	Remarks
1	Introduction and definition of terms: definition of economic minerals and economic mineral deposits: ore, ore and gangue minerals, tenor and cut-off grade, reserve and resource. What makes a viable deposit	Students will be introduced to the course as well as the basic terms employed in the course.
2 & 3	Geological characteristics of ore deposits: dispersed, confined, discordant and concordant deposits; veins, pipes and stockwork; stratiform, stratabound, syngenetic and epigenetic deposits. Classification and Textures of ore deposits	Students will learn the mode of occurrence of various ore deposit types their textures
4, 5 & 6	Formation of ore deposits: types and sources of ore-bearing fluids; nature and mode of metal transportation of hydrothermal fluids; movement of ore-bearing fluids; physical, chemical, environmental and structural factors responsible for deposition and localization of ore deposits. Supergene enrichments.	Geologic processes responsible for the concentration of metals shall be explained.
7 & 8	Wall-rock alteration. Paragenesis and zoning in	

	mineral deposits. Geothermometry and geobarometry.	
9 - 15	<p>World-Class Ore Deposits</p> <ul style="list-style-type: none"> • Deposits associated with ultramafic and mafic rocks (chromite, precious, metals, nickel, titanium, volcanogenic massive sulphides, carbonatites and kimberlites) • Deposits associated with intermediate and acid igneous rocks (mineralized granites, pegmatites, skarn deposits) • Weathering as an ore forming process (laterites, supergene enrichment, placers and evaporites) • Banded iron formations (BIFS) • Sedimentary manganese deposits • Manganese nodules • Sedimentary carbonate hosted deposits • Mineral deposits hosted by metamorphic rocks porphyry deposits and alkali granites) 	A documentation of case histories of different ore deposit types discovered in various continents/countries of the world including Nigeria.
	Practical, which involves identification and uses/applications of economic minerals will be continuous from week 3 up to week 15	