



# THE FEDERAL UNIVERSITY OF TECHNOLOGY, AKURE

## *Department of Applied Geology*

### AGY512 – Industrial Rocks and Minerals

#### COURSE PARTICULARS

**Course Code:** AGY512

**Course Title:** Industrial Rocks and Minerals

**No. of Units:** 3

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

**Status:** Compulsory

**Prerequisite:** AGY208, AGY405

#### COURSE INSTRUCTORS

**Mr M. O. Adepoju**

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#### COURSE DESCRIPTION

This is an advanced course taught in the final year. It requires good background in other courses like Rock Forming Processes, Petrology and Economic Geology. The course is divided into two parts. Part I deals with the description and classification of industrial minerals and rocks. Part II handles the geology of different industrial minerals, as well as their beneficiation procedures.

The major topics of this course are:

- Definition of industrial minerals and their classification;
- The geology, origin and occurrence of the chief categories and deposits of commercial, non-metallic minerals and rocks;
- The requirements of industry as regards the physical and chemical properties of industrial minerals and rocks, and their uses;
- Economics of industrial rocks and minerals;

#### COURSE OBJECTIVES

The objectives of this course are to:

- To train students in the fields of industrial rocks and minerals and on related aspects at undergraduate level.
- To provide an opportunity to (i) improve the skills in mineral exploration with emphasis on industrial minerals and rocks, their beneficiation and management of industrial minerals and rock industry and (ii) exploit and process industrial minerals to use as industrial raw materials.
- To provide necessary background knowledge for research in industrial minerals and rocks.

## COURSE LEARNING OUTCOMES / COMPETENCIES

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

- distinguish industrial rocks and minerals among other geological commodities;
- classify and explain the uses of different industrial minerals and rocks;
- understand the specifications of industries as regards physical and chemical properties of industrial minerals and rocks;
- carry out efficient exploration of industrial minerals;

## 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; 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 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 any of the instructors 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, etc.) during lectures. Food and drinks are not permitted in the laboratories.

## READING LIST

- Carr O.O. (1994): *Industrial minerals and rocks*, 6th edition. Society of Mining, Metallurgy and Exploration, Littleton, Colorado, 1196 pp., Annex 1
- Harben P. W., Kuzvart M. (1997): *Industrial minerals - global geology*. 462 pp., Industrial Minerals Information Ltd. (IMIL), Worcester Park, Surrey, UK. Annex 2
- Harben P.W., Bates R. L. (1984): *Geology of the nonmetallics*. Metall Bulletin Inc., New York, 392 pp.
- Harben P.W., Bates RL. (1990): *Industrial minerals - geology and world deposits* Industr. Miner. Division, Metal Bulletin Plc, London, 312 pp.
- Prentice J. E. (1990): *Geology of construction materials*. Chapman and Hall, London 201 pp.
- Evans A. (1993): *Ore geology and industrial minerals - an introduction* (3rd edition). Blackwell Scientific Publ., Oxford, 390 pp.

## COURSE OUTLINE

Week	Topic	Remarks
1, 2 & 3	Introduction, Characteristics of industrial minerals, classification of industrial minerals	
4 & 5	The geology, origin and occurrence of the chief categories and deposits of commercial, non-metallic minerals and rocks	
6, 7 & 8	The requirements of industry as regards the physical and chemical properties of industrial minerals and rocks, and their uses	
9 - 12	Geologic and physicochemical factors affecting the stability of industrial minerals and construction materials under conditions of natural weathering and exposure to salts and other pollutants	
13-15	Economics of industrial rocks and minerals; some mineral processing techniques and potential uses of mineral processing by products	
	Practical, which involves identification of industrial minerals and rocks will be continuous from week 3 up to week 15	