



THE FEDERAL UNIVERSITY OF TECHNOLOGY, AKURE

Department of Mining Engineering

MNE 304 – Surface Mining

COURSE PARTICULARS

Course Code: MNE 304

Course Title: Surface Mining

No. of Units: 3

Course Duration: Two hours of theory and two hours of practicals per week for 15 weeks.

Status: Compulsory

Course Email Address: mne304@gmail.com

Course Webpage: <http://www.mne.futa.edu.ng/courseschedule.php?coursecode=MNE%30304>

Prerequisite: NIL

COURSE INSTRUCTORS

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COURSE DESCRIPTION

This course will focus on Analysis of elements of surface mine operation. Design of surface mining systems with emphasis on minimization of adverse environmental impact and maximization of efficient use of mineral resources. Surface excavation. The uses, handling and maintenance of surface equipment and plants. Ore reserve estimates, grade control (blending and dilution), short and long range planning, unit operations, equipment selection, cost estimation, slope stability and Placer mining operation. Aggregates quarrying and dimension stones production. Ore handling equipment. Case studies of typical surface mines: coal, metallic and non-metallic mines. Scheduled Field trips to operating mines.

COURSE OBJECTIVES

The objectives of this course are to:

- introduce students to the surface mining techniques and mechanization for various academic activities; and
- provide students with opportunities to develop basic skills mine development, drilling and blasting , use of mine equipment, design of pit limit, and determination of Stripping ratio.

COURSE LEARNING OUTCOMES / COMPETENCIES

- Demonstrate a clear understanding of surface mining technologies (open pit), open cast quarrying and their design as well as the unit operations
- Design of granite quarries for production of aggregates and dimension stones
- Understand stripping ratio for determining suitable method for exploitation of ore deposit
- Design layouts for strip mining of coal and include important economic and environmental considerations
- Describe the technology for marine mining and include important economic and environmental considerations
- Fix economic pit limit

GRADING SYSTEM FOR THE COURSE

This course will be graded as follows:

Class Attendance	05%
Assignments	10%
Practical	10%
Test(s)	15%
<u>Final Examination</u>	<u>60%</u>
<u>TOTAL</u>	<u>100%</u>

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 any of the instructors, 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

¹Hartman, H. (2005). *Introduction to Mining Engineering*. 1231p.

Legend

- 1- Available in the University Library
- 2- Available in Departmental/School Libraries
- 3- Available on the Internet.
- 4- Available as Personal Collection
- 5- Available in local bookshops.

COURSE OUTLINE

Week	Topic	Remarks
1	Introduction to surface mining Analysis of elements of surface mine operation.....Bench elements	During this first class, the expectation of the students from the course will also be documented.
2 & 3	<ul style="list-style-type: none"> Design of surface mining systems with emphasis on minimization of adverse environmental impact and maximization of efficient use of mineral resources 	Practical exercise will involve design of surface mine. Start from bench elements berm e.t.c
4 & 5	<ul style="list-style-type: none"> Surface excavation. Open-pit, Open cast Aggregate and dimension stone quarry 	When learning about Surface, students will be taught different techniques of mining and analysis.
6	The uses, handling and maintenance of surface equipment and plants	Exercises will involve selection of equipment and calculation will involve cycle time, determination equipment fleet
7 & 8	<ul style="list-style-type: none"> Ore reserve estimates, grade control (blending and dilution) 	Students will be requested to obtain for given outcrop and determine the reserve and the life span of the mine.
		MID-SEMESTER TEST
9 & 10	<ul style="list-style-type: none"> short and long range planning, unit operations, Stages in the life of a mine 	Students will be taught on efficient way of carrying out mine planning and stages in mine life.

11 & 12	<ul style="list-style-type: none"> • equipment selection, • cost estimation, • and Slope stability 	Students will be divided into groups and measure dip and strike to analyse surface mine slope and remediation for unstable slopes
13 & 14	<ul style="list-style-type: none"> • Placer mining • Hydrauliclicking • Borehole mining • Heap leaching • Ore handling equipment 	Students will be taught both surface and insitu-technique.
15	REVISION	This is the week preceding the final examination. At this time, evaluation will be done to assess how far the students' expectations for the course have been met.