



Course Specification

Diploma

Course Title: Mineral Extraction and Environmental Aspects

Course Code: APMQ3213

Program: Mining and Quarrying

Department: Diploma Department

College: The Applied College

Institution: Umm Al-Qura University

Version: 1

Last Revision Date: 20 February 2025



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A. General information about the course:

1. Course Identification

1. Credit hours: (2)

2. Course type

A. ☐ University ☐ College ☒ Department ☐ Track ☐ Others
B. ☒ Required ☐ Elective

3. Level/year at which this course is offered: (2)
(2nd. Level)

4. Course General Description:

The course describes the environmental impact of mining and mineral processing: Management, Monitoring, and Auditing Strategies cover all the aspects related to mining and the environment, including environmental assessment at the early planning stages, environmental management during mine operation, and the identification of major impacts. Technologies for the treatment of mining, mineral processing, and metallurgical wastes are also covered, along with environmental management of mining wastes, including disposal options and the treatment of mining effluents.

Presents a systematic approach for environmental assessment of mining and mineral processing projects. Discusses address a number of environmental challenges, including air quality, water quality, acid mine drainage, land and economic impacts. Explains the latest in environmental monitoring and control systems to limit the environmental impact of mining and processing operations.

5. Pre-requirements for this course (if any):

None

6. Co-requisites for this course (if any):

None

7. Course Main Objective(s):

Study, assessment, and follow up of mining projects through the evaluation of their environmental impacts that result from mining processes and handling in order to protect and preserve the environment.

Find ways and strategies to develop and improve the occupational safety of those working in the mines.



Assessment of environmental impact on mining activities.

Recognize the importance of air quality, quantity, mine gases, mine dusts, heat and humidity in underground mine environment

An ability to identify and solve mineral extraction problems by applying principles of engineering and science.

Solve practical practice problems related to the subsurface monitoring for health hazards at mine activities.

knowledge on the mine accidents causes of physical accidents and their nature - Accidents statistics frequency and severity rates.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	30	100%
2	E-learning		
3	Hybrid <ul style="list-style-type: none"> Traditional classroom E-learning 		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	30
2.	Laboratory/Studio	
3.	Field	
4.	Tutorial	
5.	Others (specify)	
Total		30



B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

1.0	Knowledge and understanding			
1.1	Study, assessment, and follow up of mining projects through the evaluation of their environmental impacts that result from mining processes and handling in order to protect and preserve the environment.	K1	Lectures and Interactive Discussions	Written Exams (Mid-Term and Final Exams), Quizzes.
1.2	Find ways and strategies to develop and improve the occupational safety of those working in the mines.	K2	Lectures and Interactive Discussions	Written Exams (Mid-Term and Final Exams), Quizzes.
1.3	Assessment of environmental impact on mining activities.	K4	Lectures and Interactive Discussions	Written Exams (Mid-Term and Final Exams), Quizzes.
1.4	Recognize the importance of air quality, quantity, mine gases, mine dusts, heat and humidity in underground mine environment	K5	Lectures and Interactive Discussions	Written Exams (Mid-Term and Final Exams), Quizzes.
1.5	Identify the basic concepts of mine safety, mine environment & Hazard in mines.	K6	Lectures and Interactive Discussions	Written Exams (Mid-Term and Final Exams), Quizzes.
2.0	Skills			
2.1	An ability to identify and solve mineral extraction problems by applying principles of engineering and science.	S1	Interactive Discussions	Written Exams (Mid-Term and Final Exams), Quizzes
2.2	Solve practical practice problems related to the subsurface monitoring for health hazards at mine activities.	S2	Interactive Discussions	Written Exams (Mid-Term and Final Exams), Quizzes
3.2	knowledge on the mine accidents causes of physical accidents and their nature - Accidents statistics frequency and severity rates.	S3	Interactive Discussions	Written Exams (Mid-Term and Final Exams),
3.0	Values, autonomy, and responsibility			
3.1	Apply Knowledge to Mining and Resource Assessment, environmental verification of mining activities, rehabilitation of mines and quarries.	V1	Individual and Group Presentations	Presentations



C. Course Content

No	List of Topics	Contact Hours
1.	An introduction to minerals, ore and exploration.	2
2.	Mining processes, machinery and methods used.	2
3.	Waste and products from mineral processing.	2
4.	Environmental Impacts of Mineral Extraction.	2
5.	Land-use and management: mining and extraction.	2
6.	The different kinds of environmental impacts associated with mining.	2
7.	The different types of mining waste.	2
8.	Minimizing the environmental impact from sulphidic mine waste.	2
9.	Sustainable Development in mining.	2
10.	Environmental protection, mine closure and mine rehabilitation.	2
11.	Mineral Resources and Sustainability Issues.	2
12.	Environmental impacts of mining	2
13.	Associated Environment Issues.	2
14.	Current issues and challenges in mineral extraction.	2
15.	Recommendations on Managing the Mining Environment.	2
Total		30

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes	5	10
2.	Mid-Term Exam	8	20
3.	Presentations	12	10
4.	Homework	All weeks	10
5.	Final Exam	16	50

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	Environmental impact of mining and mineral processing: management, monitoring, and auditing strategies, Ravi K. Jain, Zengdi "Cindy" Cui, Jeremy K. Domen, Oxford, UK : Butterworth-Heinemann, 2016.
Supportive References	<ul style="list-style-type: none"> • W.W. Staley, "Introduction to Mine Surveying," 2nd. Edition, Stanford University Press, 1996.





	<ul style="list-style-type: none"> • John Walke and Joseph L. Awange, "Surveying for Civil and Mine Engineers Theory, Workshops, and Practicals," 2017. • B. A. Wills, "Mineral Processing Technology," 6th Edition, 1997.
Electronic Materials	
Other Learning Materials	

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classrooms
Technology equipment (projector, smart board, software)	Data show
Other equipment (depending on the nature of the specialty)	

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Faculty	Direct (project, HW, Quiz, midterm and final exam)
Effectiveness of Students assessment	Students	Indirect (Student Survey)
Quality of learning resources	Program Coordinator	Direct analysis
The extent to which CLOs have been achieved	Program Coordinator	Direct analysis
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify))

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Umm Al-Qura University Council
REFERENCE NO.	851110214476/195605
DATE	18/2/1447

