



Jordan University of Science and Technology
Faculty of Engineering
Chemical Engineering Department

CHE462 Extractive Metallurgy - JNQF Level: 7

First Semester 2023-2024

Course Catalog

3 Credit Hours. Scope of extractive metallurgy, chemistry of metals, classification of metals, Classification of ores and ore preparation, extraction of metals from ores, pyrometallurgy (copper and iron) and hydrometallurgy (Cu, Al, Au, and U), unit operations and technology aspects, thermodynamics and kinetics of extractive processes.

Text Book

Title	Principles of extractive metallurgy
Author(s)	Fathi Habashi
Edition	1st Edition
Short Name	textbook
Other Information	

Course References

Short name	Book name	Author(s)	Edition	Other Information
Ref # 1	Principles of extractive metallurgy	Terkel Rosenqvist	2nd Edition	
Ref # 2	Metals from Ores: An Introduction to extractive Metallurgy	Fathi Habashi	1st Edition	
Ref # 3	Textbook of Hydrometallurgy	Fathi Habashi	1st Edition	
Ref # 4	Textbook of Pyrometallurgy	Fathi Habashi	1st Edition	

Instructor

Name	Prof. Mohammad Al Harahsheh
Office Location	-

Office Hours	
Email	msalharahsheh@just.edu.jo

Class Schedule & Room
Section 1: Lecture Time: Sun, Tue, Thu : 13:30 - 14:30 Room: E2010

Prerequisites		
Line Number	Course Name	Prerequisite Type
223621	CHE362 Unit Operations	Prerequisite / Study
223121	CHE312 Materials Science And Engineering	Prerequisite / Study

Tentative List of Topics Covered		
Weeks	Topic	References
Weeks 1, 2	Introduction	Chapter 1 ,2 From textbook , chapter 1 From Ref # 1 , Chapter 1-4 From Ref # 2
Weeks 2, 3	Ore and Metals Classification	From textbook , From Ref # 1
Week 3	Mineralogy of metallic ores	From textbook , From Ref # 1
Weeks 4, 5	Hydrometallurgy	From textbook , From Ref # 3
Weeks 6, 7	Pyrometallurgy	From textbook , From Ref # 4
Weeks 8, 9	Kinetics of extractive processes	From textbook , From Ref # 2
Weeks 9, 10	Extractive metallurgy of copper	From textbook , From Ref # 4
Weeks 10, 11	Extractive metallurgy of iron and steel	From textbook , From Ref # 1 , From Ref # 4
Weeks 11, 12	Extractive metallurgy of aluminum	From textbook , From Ref # 3
Weeks 13, 14	Extractive metallurgy of Gold	From textbook , From Ref # 1 , From Ref # 3

Mapping of Course Outcomes to Program Outcomes and NQF Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Outline the principles of extractive Metallurgy and the chemistry of metals [2SO1] [1L7K1]	8%	
Classify the metals, the ores and the ore preparation methods [3SO1] [1L7S2]	10%	
Discuss the pyrometallurgical and hydrometallurgical methods used to extract metals from ores [2SO1] [1L7K1]	10%	
Describe the pyrometallurgical processing, separation, extraction and recovery of copper and iron from their ores [5SO1] [1L7K1]	20%	
Outline the fundamental principles and chemistry of hydrometallurgical processes as applied to extraction and recovery of metals (Cu, Al, Au, and U) including environmental issues associated herein [8SO1] [1L7S2]	30%	
Solve example problems related to thermodynamics and kinetics of extractive metallurgy processes [2SO6] [1L7S1]	22%	

Relationship to Program Student Outcomes (Out of 100%)						
SO1	SO2	SO3	SO4	SO5	SO6	SO7
78					22	

Relationship to NQF Outcomes (Out of 100%)		
L7K1	L7S1	L7S2
38	22	40

Evaluation	
Assessment Tool	Weight
First Exam	25%
Second Exam	25%
Performance	10%
Final Exam	40%

Policy	
Attendance	Attendance will be checked at the beginning of each class. University regulations will be strictly followed for students exceeding the maximum number of absences.
Student Conduct	It is the responsibility of each student to adhere to the principles of academic integrity. Academic integrity means that a student is honest with him/herself, fellow students, instructors, and the University in matters concerning his or her educational endeavors. Cheating will not be tolerated in this course. University regulations will be pursued and enforced on any cheating student.

Date Printed: 2023-12-13