

**School of Chemistry
Faculty of Science
University of the Punjab, Lahore
Course Outline**



BS Chemistry Semester-III					
Programme	BS Chemistry	Course Code	Chem-216	Credit Hours	3
Course Title	Metallurgical Aspects of Inorganic Compounds		Course Type	Major	
Course Introduction					
<p>This course will familiarize to students about descriptive chemistry of metals. The students will get knowledge about their discovery, extraction, separation, electronic configuration and their applications. Here is a brief description of course outlines: Occurrence of elements, Metallurgical principles & processes, Ores and minerals, Concentration of ore, Calcination, Roasting, Smelting, Metallurgy of Iron, Metallurgy of Copper, Metallurgy of Cobalt, Metallurgy of Zinc, Metallurgy of Aluminum, Metallurgy of Nickel, Metallurgy of Chromium, Metallurgy of Silver, Metallurgy of Gold</p>					
Learning Outcomes					
<p>Upon successful completion of the course, the student will:</p> <ol style="list-style-type: none"> 1. Have an in-depth knowledge of industrial processes involved in extraction of metals. 2. Understand the importance of metals in industry. 3. Types of metallurgical waste and its safe waste disposal methods from metallurgical processes. 					
Course Content			Assignments/Readings		
Week 1	Introduction and types of metallurgical processes		Reading from recommended material		
			Problem solving practice		
Week 2	Ores and minerals of Iron.		Reading from recommended material		
			Problem solving practice		
Week 3	Extraction of Iron by metallurgical processes.		Reading from recommended material		
			Problem solving practice		
Week 4	Ores and minerals of Cobalt, Zinc and their extraction by metallurgical processes.		Reading from recommended material		
			Problem solving practice		
Week 5	Ores, minerals and extraction of Aluminum by metallurgical processes.		Reading from recommended material		
			Problem solving practice		
Week 6	Extraction of Aluminum ____continue		Reading from recommended material		
			Problem solving practice		
Week 7	Ores, minerals and extraction of Nickel by metallurgical processes.		Reading from recommended material		
			Problem solving practice		

Week 8	Extraction of Nickel ____ continue	Reading from recommended material
		Problem solving practice
Week 9	Mid term assessment	
Week 10	Ores, minerals and extraction of Copper by metallurgical processes.	Reading from recommended material
		Problem solving practice
Week 11	Extraction of Copper ____ continue	Reading from recommended material
		Problem solving practice
Week 12	Ores, minerals and extraction of Chromium by metallurgical processes.	Reading from recommended material
		Problem solving practice
Week 13	Extraction of Chromium ____ continue	Reading from recommended material
		Problem solving practice
Week 14	Ores, minerals and extraction of Silver by metallurgical processes.	Reading from recommended material
		Problem solving practice
Week 15	Ores, minerals and extraction of Gold by metallurgical processes.	Reading from recommended material
		Problem solving practice
Week 16	Revision of overall aspects of metallurgy	Reading from recommended material
		Problem solving practice

Textbooks and Reading Material

1. Habashi, F. (2017). *Principles of extractive metallurgy*. Routledge.
2. Mikell P. Groover, (2007), "*Fundamentals of Modern Manufacturing: Materials, Processes, and Systems*", John Wiley & Sons, Inc.
3. Ullah, S., (2020) "*Inorganic Chemistry*", Ilmi Kitab Khana, Lahore.
4. Haidemenopoulos, G. N. (2018). *Physical metallurgy: principles and design*. CRC Press.
5. Huheey, J. E., Keiter, E. A. and Keiter, R. L.,(1997), *Inorganic Chemistry: Principles of Structure and Reactivity*, 4th ed., Prentice Hall.
6. Banica, T. , (2010), *Principles of metallurgy*, banica.u-cergy.fr.

Teaching Learning Strategies

1. Lecture Based Examination (Objective and Subjective)
2. Assignments
3. Class discussion
4. Quiz
5. Tests

Assignments: Types and Number with Calendar

1. Metallurgy of important metals
2. Safe disposal of metallurgical waste

Assessment

Sr. No.	Elements	Weightage	Details
1.	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.
2.	Formative Assessment	25%	Continuous assessment includes: Classroom participation, assignments, presentations, viva voce, attitude and behavior, hands-on-activities, short tests, projects, practical, reflections, readings, quizzes etc.
3.	Final Assessment	40%	Written Examination at the end of the semester. It is mostly in the form of a test, but owing to the nature of the course the teacher may assess their students based on term paper, research proposal development, field work and report writing etc.