

قسم هندسة الإنتاج والمعادن - فرع هندسة المعادن

الماجستير

الفصل الثاني
2-

قسم هندسة الإنتاج والمعادن – فرع هندسة المعادن			
المرحلة	الماجستير	الفصل الدراسي	الثاني
أسم المقرر	سيطرة نوعية على المعادن	Quality control for metals	
ت	نظري	عملي	الوحدات
الملاحظات	المفردات	---	2
.1	Fundamentals of Quality control and Quality assurance		
.2	Nondestructive testing and Quality control		
.3	Quality concept and statistical methods		
.4	Reliability of flaw detection by nondestructive		
.5	Quality control applications of nondestructive inspection		
.6	Nondestructive testing and their and application		
.7	Nondestructive evaluation uses and applications		
.8	Differences between NDE engineering and classical engineering		
.9	Conditional probability in NDE discrimination		
.10	Experimental testing analysis sequence in shuttle program		
.11	Design of NDE reliability experiments		
.12	Nondestructive Reliability data analysis		

قسم هندسة الإنتاج والمعادن – فرع هندسة المعادن			
المرحلة	الماجستير	الفصل الدراسي	الثاني
اسم المقرر	تكنولوجيا المواد	Materials Technology	
نظري	2	عملي	الوحدات 2
ت	الملاحظات		
.1	المفردات		
.1	Materials science materials engineering and materials technology		
.2	System and system analysis		
.3	Manufacturing and production system		
.4	The role of engineering in materials technology		
.5	Materials and manufacturing		
.6	Product design specification		
.7	The role of materials and life cycles of materials technology		
.8	Role of materials selection in materials technology		
.9	Strategic materials		
.10	Roles of ferrous materials in materials technology		
.11	Type and principles criteria of non ferrous materials		
.12	Role of strengthening mechanism in materials technology		
.13	The importance of advanced ceramic materials in materials technology		
.14	Application and features of glass and glass-ceramics		
.15	Rote and role of composite materials in materials technology		

قسم هندسة الإنتاج والمعادن – فرع هندسة المعادن				
المرحلة	الماجستير	الفصل الدراسي	الثاني	اسم المقرر
	معادن حديدية ولا حديدية	Ferrous and nonferrous materials		
	نظري	عملي	---	
	2			
الملاحظات	المفردات			
	ت			
	.1	Introduction of iron ores metallurgy of pig iron		
	.2	2 Blastfurnace (BF). -Changes ,iron ores fluxes. -Description of blast furnace. -Chemical reactions in the BF. -Improving the BF working.		
	.3	3 Production of sponge iron,gas reduction processes solid reduction processes -Direct reduction processes -Production of grey iron casting cupola furnace		
	.4	Metallurgy of steel production of steel classification of steels Steel making processes, Bessemer and Thomas process		
	.5	Basic oxygen processes (BOP) Converter s,L-D converter,kaldo converter Rotor converter .cleaning of BOP process gases		
	.6	Open-hearth processes , charge materials Open-hearth furnace, refining processes		
	.7	Electric furnaces, induction furnaces Electrodes and electric Arc ,Ra\ν materials Steel making procedures, deoxidation process		
	.8	A OD and VOD processes Vacuum steel and alloy steel making		
	.9	Degassing of steel .special methods of electro metallurgy		
	.10	Metallurgy of cast iron		
	.11	Production of greg C.I .ductile C.I, alloy cast iron		
	.12	Production of aluminum and its alloys		
	.13	Production of copper and its alloys		
	.14	Production of titanium and its alloys		
	.15	Production of magnesium and its alloys		

قسم هندسة الإنتاج والمعادن – فرع هندسة المعادن					
المرحلة	الماجستير	الفصل الدراسي	الثاني		
اسم المقرر	هندسة التآكل	عملية	---	الوحدات	2
ت	المفردات	الملاحظات	الملاحظات	الملاحظات	الملاحظات
.1	Corrosion definition and importance of corrosion				
.2	Electro chemical mechanisms				
.3	Polarization diagrams of corrosion metals				
.4	Calculation of corrosion rates				
.5	Characteristics of passivation and flade potential				
.6	Atmospheric corrosion of iron and other Metals				
.7	Oxidation and tarnish				
.8	Corrosion at elevated temperatures				
.9	Corrosion properties of some metallic materials				
.10	Corrosion management				
.11	Corrosion control by design				
.12	Corrosion control by environmental change				
.13	Cathodic and anodic protection				
.14	Coatings				

قسم هندسة الإنتاج والمعادن - فرع هندسة المعادن					
المرحلة	الماجستير	الفصل الدراسي	الثاني		
اسم المقرر	ميثالورجيا الأستخلاص	عملي	---	الوحدات	2
نظري	2	الملاحظات			
ت	المفردات				
.16	1				
.17					
.18					
.19					
.20					
.21					
.22					
.23					
.24					
.25					
.26					
.27					
.28					
.29					
.30					

Master Extraction Syllabus

1- Thermodynamics of pyro- and hydro-metallurgical extraction processes- 4 weeks

Kinetics of extraction processes. Slag and mattes. Pyrometallurgical processes including calcining, roasting, and smelting. Hydrometallurgical processes, including leaching (autoclave, agitation, and heap), purification and concentration via ion exchange, and solvent extraction, metal recovery via electrowinning, electrolysis or precipitation and refining processes.

2- EXTRACTION OF COPPER - 2 weeks

Production of copper: Introduction to copper - types of copper ores - concentration - occurrence - Nature of copper ores - Pyrometallurgical - Roasting - Smelting - converting - refining extraction of copper. Hydrometallurgical extraction of copper. Copper alloys and uses.

3- EXTRACTION OF ALUMINIUM - 2 weeks

Production of Aluminium: Introduction to Aluminium - Aluminium ores and their occurrences - extraction of Aluminium from ore - purification of bauxite - calcinations - reduction of alumina - Hall-Heroult process - factors affecting Bayer's process - factors influencing Hall-Heroult process - Mechanism of Hall -Heroult process Refining of Aluminium & Aluminium alloys and uses.

4- EXTRACTION OF ZINC AND PRECIOUS METALS - 4 weeks

Production of zinc: Introduction to zinc - Zinc ores - Pyrometallurgical extraction of Zinc - Hydrometallurgical Extraction of zinc, zinc alloys and uses. Production of gold: Amalgamation, Chlorination, Cyanidation, and Production of Silver: Chlorination, Cyanidation, Product recovery, Extraction of platinum group of metals. Electrolysis extraction: Principle - Process - Applications like extraction of metals - refining of metals.

5- Minerals dressing and Bio-Extraction- 4 weeks

Comminution, physical separation techniques, flotation. Leaching, solution purification, solvent extraction, metal winning, refining. Bacteria Leaching, Microbiological activity, Sulfides oxidation in mine tailing