

Department of Chemical Engineering				
Properties of Engineering Materials and Corrosion (64213)				
Total Credits	3			
major compulsory				
Prerequisites	P1 : General Chemistry II (23102) P2 : Statics (61110)			
Course Contents				
This course aims to introduce students into engineering materials and the relation between their properties and uses including: materials classification, crystal structures of metals, mechanical properties, failure and mechanics of fracture, destructive and non destructive tests, metallic phase diagrams, alloy systems and heat treatment methods for ferrous and non-ferrous alloys. Also students will study the principles of corrosion, their types, and methods of prevention. This course will give students an ability to use these principles and information in design of structures and equipments				
Intended Learning Outcomes (ILO's)			Student Outcomes (SO's)	Contribution
1	Distinguish between different types of material & alloys according to their chemical and physical properties.		A	50 %
2	Calculate mechanical properties of materials and define the different solid imperfections, microstructure of metals and alloys, solid failures, phase diagrams, heat treatment methods, corrosion types and corrosion control methods.		E	50 %
Textbook and/ or References				
William D. Callister, Jr., Materials Science and Engineering, an Introduction John Willey & Sons, Inc., 7th Edition, 2007				
Assessment Criteria			Percent (%)	
First Exam			20 %	
Second Exam			20 %	
Quizzes			10 %	
Final Exam			50 %	
Course Plan				
Week	Topic			
1	Introduction: Classification of materials			
2_3	Crystal Structures			
4	Imperfections in solids			
5	Microscopic examination			
6_7	Mechanical properties of materials			
8	First Exam			
9	Failure of solids			
10_11	Phase diagrams			
12	Second Exam			
13	Ferrous and Non-ferrous alloys			
14	Heat Treatment Processes			
15	Corrosion and corrosion prevention			
16	Final Exam			