Republic of Iraq

The Ministry Of Higher Education

& Scientific Research

بسم الله الرحمن الرحيم

University: Diyala
College: Engineering
Department: Materials Engineering
Stage: 4th.
Lecturer name: Ahmed Falh Hasan
Qualification: Ph.D. materileras design and engineering
Place of wor k:Mmaterials Eng. Dept.

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Course Instructor	Ahmed Falh Hasan
E-mail	Emil: ahmed_hasan_eng@uodiyala.edu.iq
Title	Materials Selection for Design I
Course Coordinator	Semester
Course Objective	Learn key concepts and methods of the quantitative treatment of materials selection for engineering applications. Develop an understanding of the relationship between design parameters and materials properties rather than relying on isolated concepts from crystallography, thermodynamics, or similar. Gain an understanding of how properties are influenced by processing, fabrication, and service conditions and how to integrate materials Selection in a range of modern engineering applications.
Course Description	An Introduction to Materials Science and Engineering, Elements effect on Materials Selection, Properties of engineering materials Families of materials for mechanical design, Material properties and their units, Materials Selection—The Basics, The Selection Strategy, Material indices, Examples of Material Indices, Ranking: Indices on charts
Textbook	***RecommendedTextbook(s):*** 1. M.F. Ashby: Materials Selection in Mechanical Design, Butterworth Heinemann, 2005. 2. Pat L. Mangonon: The Principles of Materials Selection and Design, Prentice Hall International, Inc.1999.

Course Assessments	Term Tests	Laboratory	Quizzes	Project	Final Exam
	As (30%)	As (10%)	As (10%)	----	As (50%)
General Notes	Type here general notes regarding the course				

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Course Weekly Outline

Week	Date	Topes Covered	Lab. Experiment Assignments	Notes
1		**Introduction to Materials Selection in the Design Process:** 1.1 Required properties 1.2 Process requirements 1.3 Availability of the materials 1.4 Cost of the materials		
2		**Introduction to Materials Selection in the Design Process:** 1.1 Required properties 1.2 Process requirements 1.3 Availability of the materials 1.4 Cost of the materials		
3		**Selection for some important properties I** : 2.1 Selection for the Static Strength 2.2 Selection for Stiffness 2.3 Selection for the Fatigue Resistance 2.4 Selection for the Toughness		

4		**Selection for some important properties I** : 2.1 Selection for the Static Strength 2.2 Selection for Stiffness 2.3 Selection for the Fatigue Resistance 2.4 Selection for the Toughness		
5		**Selection for the some important properties II:** 3.1 Selection for the creep and temperature resistance 3.2 Selection for the Corrosion Resistance 3.3 Selection for the wear resistance 3.4 Selection for the Thermal Properties		
6		**Selection for the some important properties II:** 3.1 Selection for the creep and temperature resistance 3.2 Selection for the Corrosion Resistance 3.3 Selection for the wear resistance 3.4 Selection for the Thermal Properties		
7		**Availability forms of materials and cost of the materials**		
8		**Several topics of discussion and Assessment exam**		
9		**Introduction to the Selection of Processes** 6.1 A consideration of the characteristics of the various types of the process. 6.2 Surface finish 6.3. Metal forming process (Casting of metals, Powder process, and machining and joining)		
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		6.2 Surface finish 6.3. Metal forming process (Casting of metals, Powder process, and machining and joining)		
11		**The cost aspects of the process selection :** 8.1 Fixed cost 8.2 Variables cost		
12		**Case study**		
13		**Case study**		
14		**Final Exam**		
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INSTRUCTOR Signature: **Dean Signature:**