



**Jordan University of Science and Technology**  
**Faculty of Engineering**  
**Industrial Engineering Department**

IE363 Engineering Materials
Summer Semester 2019-2020

Course Catalog
3 Credit Hours. This is an introductory course in engineering materials, which will deal with atomic structure and bonding, structure of crystalline solids, imperfection in solid, dislocations and strengthening mechanisms, phase diagrams and alloys formation, ferrous metals and nonferrous metals and alloys.

Text Book	
<b>Title</b>	An Introduction to Materials Science and Engineering
<b>Author(s)</b>	William D. Callister, David G. Rethwisch
<b>Edition</b>	9th Edition
<b>Short Name</b>	Ref # 1
<b>Other Information</b>	

**Course References**

Short name	Book name	Author(s)	Edition	Other Information
Ref # 2	Introduction to Engineering Materials	Vernon John	4th Edition	
Ref # 3	Introduction to Materials Science for Engineers	James F. Shackelford,	6th Edition	
Ref # 4	Engineering Materials- Properties and Selection,	K. G Budinski & M.K. Budinski	9th Edition	

Instructor	
Name	Dr. Mohammed Almomani
Office Location	M5L3 Tel 22539
Office Hours	

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Class Schedule & Room
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Section 1:  
Lecture Time: Sun, Mon, Tue, Wed : 10:00 - 11:30  
Room: منصة الكترونية

Prerequisites
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Line Number	Course Name	Prerequisite Type
292160	IE216 Mechanics Of Materials 2	Prerequisite / Pass

Tentative List of Topics Covered
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Weeks	Topic	References
Weeks 1, 2	Introduction	<b>Importance of materials; Classes of engineering materials; criteria for materials selections</b> From Ref # 1
Week 3	Atomic structure and bonding	<b>Chapter # 2</b> From Ref # 1
Weeks 4, 5	The structure of crystalline solids	<b>Chapter # 3</b> From Ref # 1
Weeks 5, 6	Imperfections in solids	<b>Chapter # 4</b> From Ref # 1
Week 7	Mechanical properties of metals	<b>Chapter # 6</b> From Ref # 1
Weeks 8, 9, 10	Strengthening mechanisms	<b>Chapter # 7</b> From Ref # 1
Weeks 11, 12, 13	Phase diagrams	<b>Chapter 9</b> From Ref # 1

Mapping of Course Outcomes to Program Student Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Understand the basic classifications, bond and structures of the most industrially important materials in order to relate basic science knowledge about atomic structure and bonding to properties of the material. [1SLO1]	20%	
Explore the elementary properties of metallic, polymers, ceramics and composites materials and recognize the relationship between the structure of these materials and their final properties [1SLO1]	30%	
Explore the different types of binary alloys phase diagrams, and understand the effect of heat treatment processes on the produced phases and structure of different materials in order to be able to design material with a predetermined set of properties [1SLO1, 1SLO6]	30%	

Understand the underlying mechanisms of the techniques that are used to strengthen and harden metals and their alloys. Thus, it becomes possible to design and tailor the mechanical properties of materials [1SLO1, 1SLO6]	20%	
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Relationship to Program Student Outcomes (Out of 100%)						
SLO1	SLO2	SLO3	SLO4	SLO5	SLO6	SLO7
75					25	

Evaluation	
Assessment Tool	Weight
First Exam	30%
Second Exam	30%
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, which is 20% of the total course's hours. No make-up test will be given without an official university-approved excuse.
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.
Teaching and learning methods	1. Active learning, where students should be active and involved in the learning process inside the classroom. 2. The teaching method that will be used in this course will be composed of a series of lectures interrupted with frequent brainstorming questions and discussions within this scope of the lecture.

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