



**JORDAN UNIVERSITY OF SCIENCE AND  
TECHNOLOGY  
INDUSTRIAL ENGINEERING DEPARTMENT**



<b>Course Number and Name</b>	IE 365 Engineering Materials Laboratory
<b>Course Description</b>	This course is designed to meet the required experience for the industrial engineering's students in the methods, which are commonly used in industry to test and examine materials. Experiments include tensile testing, impact testing, hardness testing, fatigue testing, macro- and micro examination, cold working and annealing of metals, hardening of steel by different quenching media, measure of steel's hardenability, surface hardening of mild steel and non-destructive testing.
<b>Credits and contact hours</b>	1 Credit hour; 3 Lab. hours
<b>Pre- or Co-requisites</b>	IE361 Engineering Materials
<b>Required/ Elective</b>	Required

<b>Text Book(s)</b>	Engineering Materials Laboratory Manual, prepared by Adel M. Hassan and Mohammed Hayajneh, 2000.
<b>References</b>	<ul style="list-style-type: none"> <li>• An Introduction to Materials Science and Engineering. D. Callister, Jr., 7th Edition, John Wiley &amp; Sons, 2006.</li> <li>• Introduction to Engineering Materials , V. B. John, 4th Edition, Palgrave, 2003</li> </ul>

<b>Course Objectives</b>	<ul style="list-style-type: none"> <li>• Measure key mechanical properties such as hardness, toughness, ... etc</li> <li>• Learn the effect of heat treatment on the mechanical properties</li> <li>• Examine metals' micro-structure under the microscope</li> <li>• Carry out non-destructive tests on different industrial products</li> </ul>
<b>Measured Outcomes</b>	<p>ABET 3b: Design, develop, and conduct engineering experiments and analyze outcome data.</p> <p>ABET 3g: Write technical reports and deliver professional presentations using latest technologies. Practice industry-communication and interaction skills and communicate effectively.</p> <p>ABET 3k: Apply learned techniques, tools, and skills to solve engineering problems.</p>

<b>Evaluation</b>	
<b>Assessment Tool</b>	<b>Grade Percentage</b>
Midterm Exam	30 %
Weekly Reports	30 %
Final Exam	40 %

**Course Outline**

<b>Week</b>	<b>Exp.</b>	<b>Topic</b>
1	---	<b>Lab. preparation</b>
2	1	Tension test
3	2	Hardness test
4	3	Impact test
5	4	Fatigue test
6	5	Creep test
7	6	Specimen preparation for micro-examination
8	7	Cold working and annealing
9	---	<b>Midterm Exam</b>
10	8	Steel hardening using different quenching media
11	9	Hardenability measurement using Jominy test
12	10	Defect detection using nondestructive tests
13	11	Carburizing of steel
14	---	<i>Lab compensation week</i>
15	---	<b>Final Exam</b>