



The University of Jordan
School of Engineering
Industrial Engineering Department
Second semester 2024/2025

Course name:		Properties of Engineering materials lab			
Course code:		0906274			
Credits hours		1			
Contact hours& room\office hours		13:00-16:00 (Mon., Tues., and Wed.),			
Course instructor's name, E-mail, and phone:		Prof. Sa'ed A. Musmar			
Course Coordinator:					
Text book:		Experimental Laboratory Manual in Materials Science and Engineering (Second Edition), Jordan University Press, 2010.			
Other reference(s):		N/A			
Course Description:		Destructive testing, hardness test or tension test, nondestructive testing, macroscopic and microscopic testing using optical microscope, Phase diagram, carburizing, heat treatment and grain size calculation			
Providing Department:		Industrial Engineering			
Prerequisite Course:		IE0946273 - Properties of Engineering materials			
Course type		Mandatory			
Assessment Methods:		Method	Weight %	Date	
		Reports	30%: (content 10%, Team work 10%, 10% Conduction of experiment	As will be appointed	
		Midterm exam	30%		
		Final Exam	40%	As will be appointed	
Course Learning Outcomes:		CLO #	After successful completion of this course, the student will be able to	Mapping with The ABET SOs	Target %
		CLO1	Prepare specimens for macro and macro-examination tests	6	
		CLO2	Conduct macro and micro-examination tests	5, 6	
		CLO3	Construct the phase diagram of a binary alloys	5, 6	
		CLO4	Conduct a mass transfer experiments and Heat treatment	5, 6	
		CLO5	Conduct the hardness test	5, 6	
		CLO6	Conduct a Non-destructive testing of materials	5, 6	
Brief list of topics	Week	Topic			
	1	Introduction (Theory: 1, 2, 3, &4)			

	2	Macroscopic Preparation & Examination of Metallic Materials
	3	Microscopic Preparation & Examination of Metallic Materials
	4	Grain size calculation
	5	Lecture (Theory: 5, 6, 7, 8 & 9)
	6	Phase Diagram (1) [Plotting]
	7	Phase Diagram (2) [Plotting]
	8	Phase Diagram (3) [Micro examination]
	9	Carburizing
	10	Heat-treatment after Carburizing
	11	Lecture (Theory: 10, 11, & 12)
	12	Hardness test (Brinell)
	13	Hardness test (Vickers)
	14	Hardness test (Rockwell)
	15	Lecture (Theory: 13, 14, & 15)
	ملاحظة: اللون الأخضر سيكون لون الين واللون الصففر سيكون داخل الحرم الجامعي.	
Important Notes:	<ul style="list-style-type: none"> Do not hesitate to ask questions You are required to bring a notebook and take notes in classes. Students are expected to attend every class session and they are responsible for all material, announcements, schedule changes, etc., discussed in class. Discuss the assignments among yourselves Don't Cheat; direct copying of others work will NOT be allowed or tolerated and will result in a reduction of grade. If you are found to be cheating in any way, on an exam or assignment, even signing the roll sheet for another student, you will be given an "F" for the course. There will be no exceptions. All cases of academic dishonesty will be handled in accordance with university policies and regulations. JU policy requires the faculty member to assign ZERO grade (F) if a student misses 15% of the classes that are not excused, and 20% of the classes that are excused Students are expected to be ready to take a quiz any time they have a class. There will be no make-up quizzes or home works. Any students with disabilities who need accommodations in this course are encouraged to speak with the instructor as soon as possible to make appropriate arrangements for these accommodations. 	

<i>The B.Sc. in industrial Engineering program enables students to achieve, by the time of graduation the following program learning outcome (SOs)</i>		
1	<i>An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics</i>	
2	<i>An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors</i>	
3	<i>An ability to communicate effectively with a range of audiences</i>	
4	<i>An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic,</i>	
5	<i>An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives</i>	
6	<i>An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions</i>	√