The University of Jordan
School of Engineering

Department	Course Name	Course Number	Semester
Mechanical Engineering	Materials Lab.	0904374	Second 2018/19

2005 Course Catalog Description

This laboratory serves mainly the measuring and/or determination of some material properties (strain and stress, yield stress, ultimate stress, fracture stress). Non-destructive testing of materials (NDT), micro and macro examination of materials and phase diagrams for steel.

Instructors

Name	E-mail	Sec	Office Hours		Lecture Time	
			Sun/Tus/Thu	Mon/Wed	Sun/Tus/Thu	Mon/Wed
Assoc. Prof.I. Abu-Alshaikh	i.abualshaikh@ju.edu.jo	1		Mon 12-14	12:00-14:00	Mon 15:00-17:00
		2	Tus 12-14			
		3	Thu 12-14			

Text Books

	Text book 1	Text book 2
Title	Laboratory Manual	
Author(s)		
Publisher, Year, Edition		

References

Books	1) J. Gere& B. Goodno "Mechanics of Materials" , Cengage Learning, 2009, Seventh Edition 2) R. C. Hibbeler, "Mechanics of Materials", 3) F. P. Beer, and E. R. Johnston, "Mechanics of Materials", McGraw Hill. 4) L. G. Kraige, "Mechanics of Materials", John Wiley and Sons. 5) P. Popov, "Mechanics of Materials", Prentice Hall
Journals	
Internet links	

Prerequisites

Prerequisites by topic	Material Science
Prerequisites by course	
Co-requisites by course	Strength of Materials
Prerequisite for	

Topics Covered

Week	Topics
1	Dividing students into group
2	Introduction, rules, safety issues, reports
3	Tension Test
4	Torsion Test
5	Strain Gauge Experiment
6	Creep Test
7	Hardness Tests
8	Impact Tests
9	Fatigue Test

10	Photoelasticity
11	Non-Destructive Testing

Measurable Student Outcomes (SOs) and Course Outcomes

ABET 1-7	Course Outcomes
6	**1.** Understand the mechanical behaviour of materials under different loading **conditions** like: tension, compression, torsion, fatigue, creep, impact loading and surface deformation (Hardness test**s**).
	2. Understand the basics of the theory of photo-elasticity and some modern non-destructive testing techniques.
	3. Students will be able to analyse the stress-strain diagram and other material behaviour curves, do curve fitting and use computers to analyse and interpret data to find important relations for the materials and compare between theoretical and experimental data.
5	4. Students will have the ability to use computers to write a correct-language reports that should include: cover page, abstract, data observed, sample calculation, results and discussion, practical applications, uncertainty analysis and conclusions. (At least one experiment "Non-Destructive Testing" to be submitted as group report.

Evaluation

Assessment Tools	Expected Due Date	Weight
Reports	Weekly: One report for each experiment that should include the following: Cover page (5%); Abstract (10%); Data observed (10%); Sample calculation (10%); Results and discussion (including applications) (20%); Uncertainty analysis (10%); Practical examples (5%); Conclusions (10%); Correct language (10%); Page numbering (5%); and Figures & Tables (5%).	30 %
Quizzes& Discussions		
Midterm Exam	According to the department schedule	30 %
Final Exam	According to the department schedule	40 %

Contribution of Course to Meet the Professional Components

The course contributes in finding the mechanical behavior of materialsunder different loading conditions by applying both destructive and/or nondestructive tests.

Student Outcomes (SOs)

ABET 1-7	Student Outcomes
1	An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2	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
3	An ability to communicate effectively with a range of audiences
4	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, environmental, and societal contexts
5	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
6	An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7	An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

Updated by

ABET Committee 2019