

Engineering Program

Specialization	Production and Computer Aided Manufacturing Technology
Course Number	• 2 • 2 • 2 2 9 •
Course Title	Engineering Materials Testing Laboratory
Credit Hours	(1)
Theoretical Hours	(0)
Practical Hours	(3)

Brief Course Description:

Structural analysis of materials. Photo-electrical and thermo-electrical effects analysis. Chemical, mechanical and electrical properties of materials, strength, tensile and impact testing, hardness testing, non destructive testing and inspection for detecting cracks and flaws; UT, PT, RT, DT, ...

Course Objectives:

At the end of this course student will be able to:

- 1- Perform structural analysis for materials.
- 2- Perform destructive and non-destructive material tests.
- 3- Study mechanical properties through performing materials' testing.
- 4- Study physical properties of materials.
- 5- Scan materials against cracks and defects, and performing ultrasonic inspection.

Detailed Course Description:

Number	Title	Content	Time
	Introduction	Material testing precautions, Importance of sample preparation, writing of reports, and conclusions.	
	Mechanical properties 1	Performing tensile, compression, bending, and impact tests Stress-strain relationship, elongation, toughness, Young's modulus determination Sample preparation	
	Mechanical properties 2	Performing hardness tests; Rockwell, Vickers, Brinell Surface roughness test Sample preparation	
	Chemical and physical properties	Performing material testing to study chemical and physical properties Photo-electrical and thermo electrical effects analysis.	
	Structural Analysis	Performing structural and microscope tests	
	Nondestructive testing RT, UT, PT, ET, VT, ...	Performing scans against cracks and flaws	

Evaluation Strategies:

Evaluation		Percentage	Date
Exams	Midterm	20%	
	Final Exam	50%	
Projects and Laboratory Assignments and reports		30%	

Teaching Methodology:

- Lecturing
- Workshop practicing
- Technical videos watching

Text Books & References:

Text Books:

- اختبار المواد، الإدارة العامة لتصميم وتطوير المناهج، المؤسسة العامة للتعليم الفني والتدريب المهني، المملكة العربية السعودية
- مقاومة المواد، إياد الداھوك، شادس أبو سريس

References:

- Supplied laboratory manual
- Engineering Mechanics/Statics by J.L.Meriam, last edition
- Mechanics of Materials by Russell C.Hibbeler, last edition
- Statics and Mechanics of Materials by William F.Riley, Gohn Wiley & Sons, last edition
- Mechanics of Materials, by Ferdinand Beer, last edition