



Jordan University of Science and Technology
Faculty of Engineering
Aeronautical Engineering Department

Course name and number:

AE593 Special Topics In Aeronautics (A)
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Credit, contact hours and categorization:

Credit and contact hours	Contact hours	Categorization
3 Credit Hours	Sunday-Tuesday-Thursday 1-hour lecture Or Monday-Wednesday 1.5-hours lecture	Engineering Topic

Instructor's or course coordinator's name:

Name	Dr. Abdallah Almomani
Office location	N1-L2
Email address	amalmomani0@just.edu.jo

Textbook and other supplemental materials:

Textbook	
Title	Introduction to the principals of material evaluation
Author(s)	David C.Jiles
Edition	1st Edition
Other Information	CRC Press Taylor & Francis Group 2007

References			
Book Name	Author(s)	Edition	Other Information
Nondestructive Testing Radiography Ultrasonics Liquid Penetrant Magnetic Particle Eddy Current	Louis Cartz	1 st Edition	Ref 1 : ASM International 1995
Non-Destructive Test and Evaluation of Materials	J Prasad and C. G. Krishnadas Nair	2 nd Edition	Ref 2: McGraw Hill Education (India) 2011
Handbook of Advanced Nondestructive Evaluation	Nathan Ida Norbert Meyendorf Editors	1 st Edition	Ref 3 : Springer 2019

Course information:

Course Catalogue
The purpose of this course is to provide students a synopsis on material evaluation, begins by considering the various physical properties of materials that may be of interest for materials evaluation and the means for determining these properties by widely used and lesser used non-destructive evaluation methods. The methods will include: Overview of Visual Inspection (VT), Liquid Penetrant Testing (PT), Magnetic Particle Testing (MT), Review of Surface NDT Methods, Radiographic Testing (x-ray) ; (RT), Ultrasonic Testing (UT), Eddy Current Testing (ET), Thermal Testing (TT)
Course type : This course is elective for the program.



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Prerequisites or co-requisites
Be in his graduation year and have studied materials and structures courses

Specific goals of the course :

Specific outcomes of instruction and the student outcomes (SO) mapping		
Outcomes	SO Mapping	Course Outcome Weight (Out of 100%)
Introduce the concept of material evaluation and testing concepts.	2SO 4, 1SO 6, 1SO 7, 1SO 8	5%
learn the basic mechanical properties of materials.	2.5SO 2, 2.5SO 6, 2.5SO 7, 2.5SO 8	10%
Learn the Acoustic, Ultrasonic, Thermal, Electrical, Magnetic, and Radiation effect on Materials Properties.	6SO 2, 6SO 6, 6SO 7, 6SO 8, 6SO1	30%
Learn the usage of NDE techniques, Visual and Liquid penetrant, Ultrasonic Testing, Electrical Testing, Magnetic Testing, Radiographic Testing, and Thermal Testing Methods.	10SO 2, 10SO 4, 10SO 6, 10SO 7, 10SO 8]	50%
Explain the advantages and disadvantages of using destructive and non-destructive testing techniques	2.5SO 6, 2.5SO 7	5%

Brief list of topics to be covered:

Tentative List of Topics Covered		
Weeks	Topic	References
Week 1	Introduction on Materials Evaluation and Testing Concepts	From Textbook
Week 2	Mechanical Properties of Materials	From Textbook
Week 3	Sound Waves: Acoustic and Ultrasonic Properties of Materials	From Textbook
Week 4	Thermal Properties of Materials	From Textbook
Weeks 5, 6	Electrical and Magnetic Properties of Materials	From Textbook
Weeks 6, 7	Effects of Radiation on Materials	From Textbook
Week 8	Visual and Liquid Penetrant NDE	From Textbook, Ref 1,2,3
Weeks 9, 10	Ultrasonic Testing Methods	From Textbook, Ref 1,2,3
Weeks 11, 12	Electrical Testing Methods (Eddy Current)	From Textbook, Ref 1,2,3
Week 13	Magnetic Testing Methods	From Textbook, Ref 1,2,3
Weeks 13, 14	Radiographic Testing Methods	From Textbook, Ref 1,2,3
Week 15	Thermal Testing Methods	From Textbook, Ref 1,2,3
Week 16	Destructive vs. Non-destructive Testing	From Textbook