Jordan University of Science and Technology

Faculty of Engineering

Aeronautical Engineering Department

AE544 Aeronautics Lab Ii - JNQF Level: 7
First Semester 2023-2024

Course Catalog
1 Credit Hours. This laboratory course offers hands-on experience covering diverse topics. Structural analysis experiments involve unsymmetrical bending, shear center, and the application of various loads (Bending, Shear, and Torsion) on beams with different cross sections. Additionally, students explore different loads on aircraft wings, permanent joints, and landing gears. Aircraft stability experiments include Short Period Oscillation, Phugoid Oscillation, and Trim Curves with neutral point determination. The course extends to experiments involving Electrical Gyroscopes and Cockpit Instrumentation Systems, providing students with practical insights into aerospace engineering applications.

Text Book	
Title	Lab Manual
Author(s)	AE
Edition	1st Edition
Short Name	Text Book
Other Information	

Course References

Short name	Book name	Author(s)	Edition	Other Information
Ref#1	Aircraft Structures for engineering students	T. H. G. Megson	5th Edition	
Ref#2	Flight Stability and Automatic Control	R. C. Nelson	2nd Edition	
Ref#3	Fundamentals of Aerodynamics	J. D. Anderson	6th Edition	

Instructor	
Name	**Dr. ABDALLAH ALMOMANI**
Office Location	N1- L2

Office Hours	Sun : 08:30 - 09:30 Sun : 10:30 - 11:30 Mon : 11:30 - 13:00 Tue : 08:30 - 09:30 Tue : 10:30 - 11:30 Wed : 11:30 - 13:00 Thu : 08:30 - 09:30
Email	amalmomani0@just.edu.jo

Class Schedule & Room
Section 1: Lecture Time: Wed : 14:30 - 17:30 Room: LAB

Prerequisites

Line Number	Course Name	Prerequisite Type
714440	AE444 Aeronautics Lab 1	Prerequisite / Study
715330	AE533 Aircraft Structure 1	Prerequisite / Study
715630	AE563 Aircraft Stability & Control	Prerequisite / Study

Tentative List of Topics Covered

Weeks	Topic	References
Week 1	Introduction	From **Text Book**
Week 2	Unsymmetrical Bending of a Cantilever Beam	From **Text Book**
Week 3	Shear Center	From **Text Book**
Week 4	I-Beam in Bending	From **Text Book**
Week 5	Hollow Shaft (Tubee) Analyis	From **Text Book**
Week 6	Wing strain Analysis	From **Text Book**
Week 7	Wing strain Analysis using Ansys	From **Text Book**
Week 8	MidTerm	From **Text Book**
Week 9	Trim Curves and Neutral Point Determination	From **Text Book**

Week 10	Dynamic Stability of Longitudinal Motion. Short period oscillation (Rapid Incidence Adjustment) and The Phugoid Oscillation	From **Text Book**
Week 11	Electrical Gyroscope	From **Text Book**
Week 12	Hydraulic Landing Gear system	From **Text Book**
Week 13	Cockpit Instrumnetation system	From **Text Book**
Week 14	Control Surfaces design	From **Text Book**
Week 15	Final Exam/Review	From **Text Book**

Mapping of Course Outcomes to Program Outcomes and NQF Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Apply insights gained in aircraft structures related courses to conduct experiments concerning unsymmetrical bending, and the application of various loads (Bending, Shear, and Torsion) on beams with different cross-sections. In addition to experiments concerning shear center, permanent joints, and landing gears. This hands-on experience enhances understanding and practical skills in analyzing and designing aerospace structures. [1SO6] [1L7S3]	40%	
Apply aeronautical knowledge gained in the aircraft stability course to perform experiments on aircraft stability, including Short Period Oscillation, Phugoid Oscillation, and Trim Curves with neutral point determination. These experiments provide valuable insights into the dynamic behavior of aircraft, contributing to enhanced skills in stability analysis and control. [1SO6] [1L7S3]	30%	
Apply concepts from the aircraft avionics course to conduct experiments involving Electrical Gyroscopes and Cockpit Instrumentation Systems, gaining practical insights into their applications in aerospace engineering. [1SO6] [1L7S3]	20%	
Interpret and analyze experimental data, drawing meaningful conclusions from the results obtained during the laboratory experiments. [1SO4] [1L7C2]	10%	

Relationship to Program Student Outcomes (Out of 100%)						
SO1	SO2	SO3	SO4	SO5	SO6	SO7
			10		90	

Relationship to NQF Outcomes (Out of 100%)	
L7S3	L7C2
90	10

Evaluation	
Assessment Tool	**Weight**
Midterm exam	30%
Reports	30%
Final exam	40%

Policy	
Report writing policy	Conceptual discussion is allowed. However, all substantive work must be your own. Lab Report is due one after the experiment. No late reports are allowed.
Atendance	The student is required to attend all the registered courses. The instructor shall register student attendance or absence electronically. JUST policy requires the faculty member to assign ZERO grade (35) if a student misses 20% of the classes. If you miss a class, it is your responsibility to find out about any announcements or assignments you may have missed
Exam/Homework	Makeup exam should not be given unless there is a valid excuse according to JUST policies. Arrangements to take an exam at a time other than the one scheduled MUST be made prior to the scheduled exam time. Cheating or copying from neighbor on exam, quiz, or homework is an illegal and unethical activity. Standard JUST policy will be applied. All assignments must be your own work (your own words) Students are responsible for all information provided in lecture. Information presented in class supersedes any information posted elsewhere

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