Jordan University of Science and Technology

Faculty of Engineering

Aeronautical Engineering Department

AE444 Aeronautics Lab 1
First Semester 2023-2024

Course Catalog
1 Credit Hours. Basic measurements of aerodynamic forces and pressure distribution using low speed wind tunnel. Supersonic flow, flight demonstration, tunnel experiments. Aerospace propulsion (gas turbines), ramjets, etc.). Basic aircraft sensors.

Text Book	
Title	Class Hanout
Author(s)	AE
Edition	1st Edition
Short Name	Textbook
Other Information	

Course References

Short name	Book name	Author(s)	Edition	Other Information
Ref#1	Fundamentals of Aerodynamics	J. D. Anderson	6th Edition	
Ref#2	Low-Speed wind tunnel testing	J.B. Barlow, W. H. Rae Jr., A. Pope	1st Edition	

Instructor	
Name	**Dr. Montasir Hader**
Office Location	N1L2
Office Hours	Sun : 09:30 - 10:30 Sun : 11:30 - 12:30 Mon : 13:30 - 14:30 Tue : 09:30 - 10:30 Tue : 11:30 - 12:30 Thu : 09:30 - 10:30
Email	hader@just.edu.jo

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

Prerequisites		
Line Number	**Course Name**	**Prerequisite Type**
714130	AE413 Mechanics Of Materials Lab	Prerequisite / Study
714430	AE443 Gas Dynamics	Prerequisite / Study

Tentative List of Topics Covered		
Weeks	**Topic**	**References**
Week 1	Introduction	**Intro** From **Textbook**
Week 2	Calibration of Wind Tunnel	**Exp#1** From **Textbook**
Week 3	Airfoil Characteristics	**Exp#2** From **Textbook**
Week 4	Pressure Distribution over an Airfoil	**Exp#3** From **Textbook**
Week 5	Pressure Distribution over an Airfoil using Air Flow Bench (Airofoil with Tappings)	**Exp#4** From **Textbook**
Week 6	Drag Measurement on Circular Cylinder	**Exp#5** From **Textbook**
Week 7	The effect of high lift devices on Airfoil Characteristics	**Exp#6** From **Textbook**
Week 8	MidTerm	From **Textbook**
Week 9	Bernoulli's Equation Applied to A Convergent-Divergent Passage	**Exp#7** From **Textbook**
Week 10	Boundary Layers	**Exp#8** From **Textbook**
Week 11	Demonstrates the thermodynamics and fluid mechanics of the adiabatic expansion of air through subsonic and supersonic nozzles	**Exp#9** From **Textbook**
Week 12	Investigates subsonic and supersonic air flow, including flow around two dimensional models	From **Textbook**
Week 13	Round Turbulent Jet	From **Textbook**

Weeks 14, 15	Final Exam/Review	From **Textbook**

Mapping of Course Outcomes to Program Outcomes	**Course Outcome Weight (Out of 100%)**	**Assessment method**
Conduct experiments that reinforce and verify concepts covered in Aerodynamic courses [15SO1, 15SO2, 40SO6]	20%	
Analyze experimental data and quantitatively evaluate a flow system [20SO1, 30SO6]	20%	
Analyze the perform the study of a family of NACA/airfoil profiles [10SO1, 30SO2, 20SO6]	20%	
Utilize wind tunnel and various pressure probes/liquid manometers for the measurement of total and static pressure within the flow field, from which be able to compute flow speed [20SO2, 60SO6]	20%	
Develop the students written, oral, and graphical communication skills [60SO3, 40SO5]	20%	

Relationship to Program Student Outcomes (Out of 100%)						
SO1	SO2	SO3	SO4	SO5	SO6	SO7
15.62	19.29	12		8	45.1	

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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