The University of Jordan
School of Engineering

Department	Course Name	Course Number	Semester
Mechanical Engineering	Aeronautics Lab. 1	0994364	Spring

2025 Course Catalog Description

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.

Instructors

Name	E-mail	Section	Office Hours	Lecture Time

Text Books

	Text book 1	Text book 2
Title	Class Handout	
Author(s)	AE	
Publisher, Year, Edition		

References

Books	1. Fundamentals of Aerodynamics, J. D. Anderson, 6th Edition. 2. Low-Speed wind tunnel testing, J.B. Barlow, W. H. Rae Jr., A. Pope, 1st Edition.
Journals	
Internet links	

Prerequisites

Prerequisites by topic	-
Prerequisites by course	Aerodynamics I 0994363
Co-requisites by course	-
Prerequisite for	Field Aeronautics Lab. II

Topics Covered

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

Mapping of Course Outcomes to ABET Student Outcomes	
SOs	**Course Outcomes**
5,6	To teach the students how to perform the study of a family of NACA/airfoil profiles. Operate a wind tunnel and utilize 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. Analyze experimental data and quantitatively evaluate a flow system. Enhance the students written, oral, and graphical communication skills. Conduct experiments that reinforce and verify concepts covered in Aerodynamic course.

Evaluation		
Assessment Tools	**Expected Due Date**	**Weight**
First Exam		25
Second Exam		25
Final Exam		50

Contribution of Course to Meet the Professional Components

This course is one of the first opportunities for engineering students to encounter the fundamental principles of design problem solving. It is an important prerequisite course for number of designs related-courses, which occur later in the programs of engineering students.

Relationship to Student Outcomes

SOs	1	2	3	4	5	6	7
Availability					X	X	

Relationship to Aeronautical Engineering Program Objectives (AEPOs)

AEPO1	AEPO2	AEPO3	AEPO4	AEPO5

ABET Student Outcomes (SOs)

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, 2025