



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

**Course name and number:**

<b>AE443 Gas Dynamics</b>
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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. Montasir Hader
Office location	N1-L2
Email address	hader@just.edu.jo

**Textbook and other supplemental materials:**

Textbook			
Title	Fundamentals of Aerodynamics		
Author(s)	J. D. Anderson		
Edition	6 <sup>th</sup> Edition		
Other Information	McGraw-Hill's		
References			
Book Name	Author(s)	Edition	Other Information
Modern Compressible Flow: With Historical Perspective	J. D. Anderson	2nd Edition	McGraw-Hill's

**Course information:**

Course Catalogue		
One-dimensional gas dynamics, normal and oblique shock waves, Prandtl-Meyer flows, Rayleigh and Fanno-line flow, airfoils in supersonic flow, thin airfoil theory.		
<b>Course type:</b> This course is <b>required</b> to fulfill the program.		
Prerequisites or co-requisites		
Line Number	Course Name	Prerequisite Type
713440	AE344 Aerodynamics (1)	Prerequisite / Pass



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**Specific goals of the course :**

Specific outcomes of instruction and the student outcomes (SO) mapping		
Outcomes	SO Mapping	Course Outcome Weight (Out of 100%)
Understand definition and fundamental aspects of compressible flow	7SO 1, 3SO 4	20%
To teach students how thermo dynamical concepts apply to gas dynamics.	5SO 1, 5SO 2	20%
To familiarize students with the features of inviscid compressible flows, including shock waves, expansion fans.	6SO 1, 4SO 2	20%
To teach students to analyze or compute one-dimensional and quasi one dimensional flows in typical applications such as supersonic wind tunnels, and rocket nozzles.	6SO 1, 3SO 2, 3SO 4	20%
To relate gas dynamics to aircraft aerodynamics and supersonic flight performance.	2SO 1, 3SO 2, 5SO 4	20%

**Brief list of topics to be covered:**

Tentative List of Topics Covered		
Weeks	Topic	References
Weeks 1, 2	Principles of thermodynamics, Compressible Flow: Some Preliminary Aspects	From <b>Textbook</b>
Weeks 3, 4, 5	Normal Shock Waves and Related Topics	From <b>Textbook</b>
Weeks 6, 7, 8	Oblique Shock and Expansion Waves	From <b>Textbook</b>
Weeks 9, 10, 11	Compressible Flow through Nozzles, Diffusers, and Wind Tunnels	From <b>Textbook</b>
Weeks 12, 13	Analysis of Fanno and Rayleigh flow	From <b>Ref#1</b>
Weeks 14, 15	Subsonic Compressible Flow over Airfoils: Linear Theory	From <b>Textbook</b>
Weeks 16	Linearized Supersonic Flow	From <b>Textbook</b>