

Year & Sem:	Course Code: ME3619	Course Name: Gas dynamics	No. of Credits: 4	L	T&PS	P
				2	2	0

Review of Fundamentals: Concepts from Fluid Mechanics, Basic Thermodynamic Relations
Compressible flow: Concept of Waves in fluid, Mach waves, Compression waves, Expansion waves
Basic Flow features: Isentropic flow, Shock waves, Stationary and Moving Shocks, Oblique Shocks, Bow Shocks, Expansion Fans
Example flows: Flow around bodies, Shock expansion method for flow over airfoils. Flow Through a nozzle: Convergent Nozzles, CD Nozzles, Exit Pressure variation vs Stagnation pressure variation. Oblique shock wave reflections, Jet flows Under- and over-expanded flows Shear layers Other Non-isentropic flows
Flow with Friction, Friction choking Flow with heat addition, Thermal choking Supersonic combustion
Experimental Methods Shock Tube, Supersonic Wind tunnel, Flow visualization, Supersonic Probes. Methods of characteristics. Design of nozzles, External flow around bodies
Experimental characteristics of airfoils in compressible flow. Unsteady flows.

References/Text Books:

1. Liepmann, H.W., and Roshko, A. Elements of Gas Dynamics Dover Publications, Inc., Mineola, NY, USA.
2. Oosthuizen, P.H., and Carscallen, W.E., Compressible Fluid Flow McGraw-Hill international editions, McGraw-Hill Companies, Inc., Singapore.
3. Babu V. Fundamentals of Gas Dynamics Ane Books India, Chennai.
4. Chapman A.J. and Walker W.F. Introductory Gas Dynamics Holt, Reinhart and Winston, Inc. NY, USA.

Lecture Plan: Unit-I & -II syllabus for MID-I, Unit-III & -IV syllabus for MID-II and Unit-V & -VI syllabus for MID-III examinations.

Video Lectures (Web Links):

- 1.
- 2.

Study Materials (Web Links):

- 1.
- 2.

Problems & Solutions (Web Links):

- 1.
- 2.

Assignments (Web Links):

- 1.
- 2.