						CWS	**PRS**	**MTE**	**ETE**	**PRE**
L	**T**	**P**	Credit	Area		15/25	25	20/25	40/50	-
3	0/1	2/0	4	DEC/GEC						

ME308 Gas Dynamics and Jet Propulsion

Objective: To enable the students to understand the fundamentals of continuity equation, momentum equation, energy equation. To understand concept of aircraft propulsion theory, ramjet engine, pulsejet engine; rocket propulsion and its theory.

Syllabus		**Contact Hours**
Unit-1	Continuity equation, Momentum equation, Energy equation, stagnation properties	6
Unit-2	Isentropic flow with variable area, wave motion; Flow with normal shock waves, oblique shock waves	8
Unit-3	Flow in constant area duct with friction and with heat transfer	6
Unit-4	Measurement of fluid properties, anemometer, flow visualization.	8
Unit-5	Aircraft propulsion theory, Ramjet engine, Pulsejet engine; Rocket propulsion and its theory	8
Unit-6	Liquid propellant, solid propellant, rocket applications, space flights.	6
	Total	42

Reference Book:	
1	S.M. Yahya, "Fundamentals of Compressible Flow ", New Age International (P) Limited, New Delhi, ISBN-9788122426687, 1996.
2	P. Hill and C. Peterson, "Mechanics and Thermodynamics of Propulsion ", Addison -Wesley Publishing Company, ISBN- 0201146592, 1992.
3	N.J. Zucrow, "Aircraft and Missile Propulsion, Vol. I & II ", John Wiley, ISBN- 9780758104519, 1975.
4	N.J. Zucrow, "Principles of Jet Propulsion and Gas Turbines ", John Wiley, New York, ISBN- 1258694360, 1970.
5	H. Cohen, G.E.C. Rogers and Saravanamuttoo, "Gas Turbine Theory ", Longman Group Ltd, ISBN-0582236320, 1980.
6	G.P. Sutton, "Rocket Propulsion Elements ", John Wiley, New York, ISBN- 9780470080245, 1986.
7	A.H. Shapiro, "Dynamics and Thermodynamics of Compressible Fluid Flow Vol. kl "John Wiley, New York, ISBN- 0471066915, 1953.
8	V. Ganesan, "Gas Turbines ", Tata McGraw Hill Publishing Co., New Delhi, ISBN- 0070681929, 1999.

Course Outcomes

CO1	Apply the thermodynamics concepts in relation to compressible flows and derive relationships between various compressible flow parameters
CO2	Understanding of isentropic compressible flows in variable area ducts and apply in design of static components like nozzles and diffusers
CO3	Solve for compressible flow characteristics with friction and heat transfer
CO4	Develop relationship for shocks and determine their characteristics under various conditions
CO5	Analyze the performance of aircraft and rocket propulsion engines
CO6	Apply for aircraft and rocket propulsion

CO-PO/PSO Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	2	2	0	0	0	0	0	0	2	2	1	1
CO2	3	3	2	3	1	0	0	0	0	0	0	1	2	1	1
CO3	3	3	3	3	1	0	0	0	0	0	0	2	3	3	2
CO4	3	3	3	3	1	0	0	0	0	0	0	1	3	3	2
CO5	2	2	2	2	2	0	0	0	0	0	0	1	2	2	2
CO6	3	3	3	2	2	0	0	0	0	0	0	2	2	1	1