III B. Tech – II Semester
(20ME6636) JET PROPULSION AND ROCKET ENGINEERING

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
30	70	100	3	1	-	4

Pre-Requisites: Thermodynamics, Fluid mechanics

Course Objectives:
The Students will acquire the knowledge
- To interpret the working principles of gas turbines.
- To discuss the working principles turbojet and turboprop engines.
- To outline the concepts of Ramjet.
- To discuss working of various rocket engines.
- To outline the performance evaluation of rocket engines.

UNIT-I:
Fundamentals of Gas Turbine theory-Then-no dynamic Cycles, open closed and semi-closed — parameters of performances —cycle modifications for improvement of performance. JET PROPULSION: Historical sketch-reaction principle — essential features of propulsion devices-Thermal Engines, Classification of— Energy flow thrust, Thrust power and propulsion efficiency-Need for Thermal Jet Engines and applications.

UNIT-II:
TURBOPROP AND TURBOJET: Thermo dynamic cycles, plant layout, essential components, principles of operation — performance evaluation. Thrust Augmentation and Thrust reversal-Contrasting with piston Engine Propeller plant.

UNIT-III:
RAMJET: Thermo dynamic Cycle, plant lay-out, essential components — principle of operation – performance evaluation — comparison among atmospheric thermal jet engines — scram jet and pulse jet, elementary treatment.

UNIT-IV:
ROCKET ENGINES: Need for applications – Basic principles of operation and parameters of performance – classification – solid and liquid propellant rocket engines, advantages, domains of application – propellants – comparison of propulsion systems.

UNIT – V:
Rocket Performance: Rocket thrust equation, specific impulse, weight flow ratio, Tsiolkovsky's Rocket Equation, Rocket staging.

Course Outcomes:

After successful completion of the course, the students will be able to:

S. No	Course Outcome	BTL
1.	Illustrate the working principles of gas turbines.	L2
2.	Explain the working principles turbojet and turboprop engines.	L2
3.	Summarize the working of Ramjet.	L2
4.	Describe the theory of working of various rocket engines.	L2
5.	Outline the performance evaluation of rocket engines.	L3

Correlation of COs with POs& PSOs:

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

Text Books

1. Gas Turbines and propulsive systems/P.Khajurja & S.P.Dubey / Dhanpat rai pub.
2. Gas Dynamics & Space Propulsion! M.C.Ramaswamy / Jaico Publishing House.

Reference Books:

1. Rocket propulsion Elements I Suon I John ‘iViley & Sons / 7 Edition.
2. Gas Turbines /Cohen, Rogers & Saana Muoo/Addision esIey & Longman.
3. Gas TurbinesN, Ganesan /TMH.
4. Elements of Gas Turbine Propulsion I Jock D Maftingly /Mc Grill.