

AMAE16 PROPULSION-II

UNIT-1 AIRCRAFT GAS TURBINES

- 1.1 Impulse and reaction blading of gas turbines- Velocity triangles and power output
- 1.2 Elementary theory- Vortex theory- Choice of blade profile, pitch and chord-
- 1.3 Estimation of stage performance- Limiting factors in gas turbine design
- 1.4 Overall turbine performance
- 1.5 Methods of blade cooling- Matching of turbine and compressor.

UNIT-2 RAMJET PROPULSION

- 2.1 Operating principle- Sub critical, critical and supercritical operation
- 2.2 Combustion in ramjet engine- Ramjet performance
- 2.3 Simple ramjet design calculations- Introduction to scramjet.

UNIT-3 FUNDAMENTALS OF ROCKET PROPULSION

- 3.1 Operating principle
- 3.2 Specific impulse of a rocket- internal ballistics- Rocket nozzle classification
- 3.3 Rocket performance considerations.

UNIT-4 CHEMICAL ROCKETS

- 4.1 Solid propellant rockets- Selection criteria of solid propellants
- 4.2 Important hardware components of solid rockets
- 4.3 Propellant grain design consideration
- 4.4 Liquid propellant rockets- Selection of liquid propellants.
- 4.5 Cooling in liquid rockets- Hybrid rockets.

UNIT-5 ADVANCED PROPULSION TECHNIQUES

- 5.1 Electric rocket propulsion- Ion propulsion techniques
- 5.2 Nuclear rocket- Types- Solar sail- Preliminary Concepts in nozzleless propulsion.

References Books:

1. Cohen, H., Rogers, G.F.C. and Saravanamuttoo, H.I.H., "Gas Turbine Theory", Longman Co., ELBS Ed., 1989.
2. Gordon, C.V., "Aero thermodynamics of Gas Turbine and Rocket Propulsion", AIAA Education Series, New York, 1989.
3. Mathur, M., and Sharma, R.P., "Gas Turbines and Jet and Rocket Propulsion", Standard Publishers, New Delhi, 1988.