

# GUJARAT TECHNOLOGICAL UNIVERSITY

B.E Semester: 4

## Aeronautical Engineering

Subject Name : Fundamentals of Aeronautics

Sr. No.	Course content
1.	<p><b><u>BASIC AERODYNAMICS:</u></b></p> <p>Introduction of Basic Aerodynamics, review of atmospheric physics (Different regimes of atmosphere), Airfoil nomenclature, elementary aerodynamics (lift, drag, thrust, moments and airfoil stalling), critical Mach number and critical pressure coefficient, drag divergence Mach number, finite wing swept wing. Lift production: Alternate understanding</p>
2.	<p><b><u>ELEMENTS OF AIRPLANE PERFORMANCE:</u></b></p> <p>Introduction. Equation of motion. Thrust required for level unaccelerated flight, Thrust available and maximum velocity. Power required for level unaccelerated flight. Power available and maximum velocity for reciprocating engine – propeller combination and jet engine. Altitude effect of power available and power required. Rate of climb, gliding flight. Absolute and Ceiling. Time of climb. Range &amp; Endurance for propeller driven and jet air plane</p>
3.	<p><b><u>FUNDAMENTALS OF AIRCRAFT STRUCTURE:</u></b></p> <p>Introduction to aircraft structure, Classification of aircraft parts, Basic function of aircraft structure, Aircraft configuration and principle types of construction. Details of constructional features of conventional aircraft. Introduction to Landing gears and types of landing gears</p>
4.	<p><b><u>FUNDAMENTALS OF PROPULSION:</u></b></p> <p>Introduction, Review of different propulsion systems, Fundamentals of Propulsion, Fundamental gas turbine cycles and Propulsion Techniques. The propeller. The reciprocating engine, Jet propulsion – thrust equations. Turbojet engine. Turbofan engine, Ramjet Engine. Rocket engine. Rocket equation</p>

**REFERENCE BOOKS:**

1. Aerodynamics by L.J.Clancy, Published by Sterling Book House, Indian Edition
2. Fundamentals of Aerodynamics by John D. Anderson, Jr. McGraw Hill, Inc
3. Introduction to Flight by John D. Anderson, Jr. McGraw Hill, Inc
4. Flight without Formulae by A. C. Kermode
5. Elements of Gas Turbine Propulsion by Mattingly
6. Gas Turbine by V. Ganesan, Tata-McGraw Hill Publishing Company Ltd, New Delhi