

AMAE02 ELEMENTS OF AERONAUTICS

UNIT-1 AIRCRAFT CONFIGURATIONS

- 1.1 Brief History-Components of an airplane and their functions.
- 1.2 Different types of flight vehicles, classifications.
- 1.3 Basic instruments for flying,

UNIT-2 INTRODUCTION TO PRINCIPLES OF FLIGHT

- 2.1 Physical properties and structure of the atmosphere,
- 2.2 Temperature, pressure and altitude relationships,
- 2.3 Evolution of lift, drag and moment. Different types of drag.

UNIT-3 INTRODUCTION TO AERODYNAMICS

- 3.1 Aerodynamic forces on aircraft
- 3.2 Classification of NACA aero foils, aspect ratio, wing loading, Mach number,
- 3.3 Center of pressure and aerodynamic centre
- 3.4 Aero foil characteristics lift, drag curves.

UNIT-4 INTRODUCTION TO AIRPLANE STRUCTURES AND MATERIALS

- 4.1 General types of construction, Monocoque, semi-monocoque.
- 4.2 Typical wing and fuselage structure.
- 4.3 Metallic and non-metallic materials,
- 4.4 Use of aluminium alloy, titanium, stainless steel and composite materials.

UNIT-5 POWER PLANTS USED IN AIRPLANES

- 5.1 Basic ideas about piston, turboprop and jet engines,
- 5.2 Use of propeller and jets for thrust production.,
- 5.3 Principles of operation of rocket, types of rockets

References Book:

1. Kermode, A.C., "Flight without Formulae", McGraw-Hill, 1997.