AMAEE03 AERODYNAMICS-I

UNIT-1 REVIEW OF BASIC FLUID MECHANIC

1.1 Continuity, momentum and energy equations.

UNIT-2 TWO DIMENSIONAL FLOWS

2.1 Basic flows- Source, Sink, Free and Forced vortex, uniform parallel flow.

2.2 Their combinations,

2.3 Pressure and velocity distributions on bodies with and without circulation in ideal and real fluid flows.

UNIT-3 GENERATION OF LIFT

3.1 Kutta Joukowski's theorem.

3.2 Kutta condition. Blasius theorem.

UNIT-4 AIRFOIL AND WING THEORY

4.1 Joukowski, Karman - Trefftz, Profiles

4.2 Thin aerofoil theory and its applications.

4.3 Vortex line, Horse shoe vortex, Biot and Savart law, Lifting line theory and its limitations.

UNIT-5 VISCOUS FLOW

5.1 Newton's law of viscosity, Boundary Layer,

5.2 Navier-Stokes equation, displacement, Momentum thickness,

5.3 Flow over a flat plate, Blasins solution.

References Books:

1. Houghton, E.L., and Carruthers, N.B., "Aerodynamics for Engineering students", Edward Arnold Publishers Ltd., London, 1989.
2. Milne Thomson, L.H., "Theoretical aerodynamics", Macmillan, 1985.
3. Clancey, L.J., "Aerodynamics", Pitman, 1986