Course Title	Course Code	Credit Hours
Fundamentals of Incompressible Aerodynamics	AE-221	3-1

Textbooks:

- John D. Anderson, "Fundamentals of Aerodynamics", McGraw Hill
- Frank M. White, "Fluid Mechanics", McGraw Hill

Reference Books/Materials:

- E. L. Houghton, and P. W. Carpenter, "Aerodynamics for Engineering Students", Butterworth-Heinemann
- John D. Anderson, "Introduction to Flight", McGraw-Hill
- EASA Part-66 Category B1 Maintenance License Module 2, "Physics"
- EASA Part-66 Category B1 Maintenance License Module 8, "Basic Aerodynamics"
- EASA Part-66 Category B1 Maintenance License Module 11, "Aircraft Aerodynamics, Structure and Systems"

Course Objectives:

This is the first course in Aerodynamics, which aims to introduce students to the fundamentals of fluid mechanics and incompressible aerodynamics.

Course Outline:

- Types of Flows:
    - Continuum versus Free Molecular Flow
    - Inviscid versus Viscous Flow
    - Incompressible versus Compressible Flow
- Fluid Statics: Buoyancy Force, Manometer Application, Review of Vector Relations
- Models of the Fluid: Control Volumes and Fluid Elements, Dynamics of Fluid Flow (Reynolds Transport Theorem)
- Linear Momentum Equation: Control Volume / Integral Form, Differential Form
- Bernoulli's Equation, Energy Equation

- Control Volume / Integral Form Differential form, Accelerated Field: Material Derivative
- Flow Visualization: Path-lines Stream-lines Streak-lines
- Fundamentals of Incompressible and Irrotational Flow
- Angular Velocity, and Vorticity, Strain, Circulation Stream Function
- Velocity Potential
- Governing Equation for Incompressible and Irrotational Flow
  Laplace Equation