

AE 6070 Rotary Wing Aerodynamics

Catalog data: AE 6070- Rotary Wing Aerodynamics. 3-0-3

Vortex wake modeling, Analytical inflow theories. Modern computational methods for rotary wing aerodynamic analysis. Aerodynamic Noise.

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Prerequisites: Propeller and Rotor Theory, at the level of AE 4470.

Text: At the level of Wayne Johnson, Helicopter Theory, Dover Publication Inc.

Lecture Topics:

1. Introduction to Vortex Wake Theories - Gray and Landgrebe Tip Vortex Models
2. Lifting Line Analysis of Rotor Blades in Hover
3. Extension of Lifting Line, Lifting Surface and Panel Methods to Rotors in Forward Flight
4. Panel methods for Rotor Blades
5. Lifting Surface Analysis of Rotor Blades
6. Dynamic Inflow Theory
7. Modern CFD Theories and their links to Vortex Wake Theories
8. Potential Flow methods
9. Euler and Navier-Stokes based Methods
10. Aerodynamic Sources of Rotor Noise