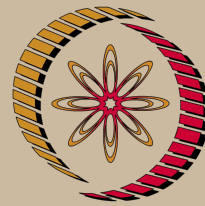


Aero elasticity - Video course

COURSE DETAIL

| S.No | Topics | No.of Hours |
|---------------------|---|-------------|
| 1 | Introduction | |
| | Aero elastic Problems. | 2 |
| | Deformation of Structures and Influence Coefficients. | 3 |
| | Energy Method. | 2 |
| 2 | Classification and Solution of Aero elastic Problems. | 2 |
| 3 | Static Aero elasticity. | 12 |
| | Divergence of 2-D airfoil and Straight Wing. | |
| | Aileron Reversal. | |
| | Control Effectiveness. | |
| | Wing loading and deformations. | |
| Swept Wing. | | |
| 4 | Dynamic Aero elasticity. | 4 |
| | Dynamic/Flutter model of 2-D Airfoil. | |
| 5 | Unsteady Aerodynamics. | 10 |
| | 2-D and 3-D Supersonic flow. | |
| | Subsonic flow (Kernal Function Approach). | |
| | Theodorsen Theory. | |
| Finite State Model. | | |
| 6 | Flutter Calculation. | 7 |
| | U-g Method. | |
| | P-k Method. | |
| | Exact Treatment of Bending - Torsion Flutter of Uniform Wing. | |
| | Flutter Analysis by Assumed Mode Method. | |



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Aerospace Engineering

Pre-requisites:

1. Dynamics and vibration
Mechanics of solids, Aerospace structures Basic Aerodynamics.

Additional Reading:

1. Research articles

Coordinators:

Prof. C. Venkatesan
Department of Aerospace
Engineering IIT Kanpur

References:

1. E.H. Dowell et.al., "A Modern Course in Aero elasticity", Sijthoff & Noordhoff, 1980.
2. R.L. Bisplinghoff, H. Ashley and R.L. Halfman, "Aero elasticity", Addison-Wesley, 1955.
3. D.H. Hodges and G.A. Pierce, "Introduction to Structural Dynamics and Aeroelasticity" Cambridge Aerospace Series, 2002.
4. V.V. Bolotin, "Nonconservative Problems of the Elastic Theory of Stability", Pergamon Press, 1963.
5. R.L. Bisplinghoff and H. Ashley, "Principles of Aeroelasticity", Dover, 1962.
6. R.H. Scanlan and R. Rosenbaum, "Introduction to the study of Aircraft Vibration and Flutter" Macmillan, 1951.
7. Y.C. Fung, "An Introduction to the Theory of Aeroelasticity", John Wiley & sons, 1955.
8. AGARD Manual on Aeroelasticity, Vol. I-Vi, Since 1959 with continual updating.
9. H. Ashley, "Aeroelasticity", Applied Mechanics Reviews, Feb. 1970.
10. E. Simiu & Scanlan, R.H., Wind effects on structures: An Introduction to wind Engineering, John Wiley 1978.
11. Blevins, R.D., Flow induced Vibrations, Von Nostrand Rheinhold co. 1977.