

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Aerospace Engineering - Flight Dynamics II (Stability)

Subject Co-ordinator - Dr. Nandan Kumar Sinha

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Earth Atmosphere, Aircraft components, Aircraft nomenclature
- Lecture 2 - Basic aerodynamics
- Lecture 3 - Equilibrium and stability
- Lecture 4 - Static vs dynamic stability
- Lecture 5 - Criterion for stability, Wing contribution
- Lecture 6 - Horizontal tail contribution
- Lecture 7 - Wing plus tail contribution
- Lecture 8 - Static margin and CG limits
- Lecture 9 - Fuselage contribution
- Lecture 10 - Powerplant contribution
- Lecture 11 - Power effects on neutral point
- Lecture 12 - Elevator
- Lecture 13 - Stick free stability, Most fwd CG location
- Lecture 14 - Longitudinal stick force per 'g', Ground effect
- Lecture 15 - Control requirement, Pull-up maneuver, Maneuver point
- Lecture 16 - Elevator per 'g', Maneuver point
- Lecture 17 - Example problems
- Lecture 18 - Lateral-Directional Stability Derivatives, Fuselage/Vertical fin contribution
- Lecture 19 - Roll stability, Wing sweep effect, Rudder
- Lecture 20 - Dihedral effect, Various contributions
- Lecture 21 - Power effects, Roll control, Aileron
- Lecture 22 - Example problems
- Lecture 23 - Derivation of Translational Motion Equations
- Lecture 24 - Derivation of Angular Motion Equations
- Lecture 25 - Description of various forces and moments
- Lecture 26 - Nonlinearities and Associated Aircraft Behavior
- Lecture 27 - Small perturbation method, Linearization of equations
- Lecture 28 - Aerodynamic force and Moment Derivatives
- Lecture 29 - Contribution of Aircraft components to Aerodynamic Derivatives

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- Lecture 30 - Linear Model and Aircraft Dynamics Modes
- Lecture 31 - Short Period, Phugoid (Lanchester's formulation)
- Lecture 32 - Short period mode approximation
- Lecture 33 - Flying and Handling Qualities, Cooper Harper Scale
- Lecture 34 - Pure rolling motion, Pure yawing motion, Spiral approximation
- Lecture 35 - Spiral, Roll, Dutch roll Mode approximations
- Lecture 36 - Lateral directional Flying Qualities, Routh's Stability criterion
- Lecture 37 - Stability in Steady Roll Maneuver
- Lecture 38 - Wind Effect on Aircraft Pure Plunging Motion
- Lecture 39 - Wind Profiles, Longitudinal Mode Response to Wind Shear
- Lecture 40 - Stability control/Augmentation
- Lecture 41 - Autopilots, Automatic Landing System