

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

NPTEL Video Course - Aerospace Engineering - NOC:Introduction to Rocket Propulsion

Subject Co-ordinator - Dr. D.P. Mishra

Co-ordinating Institute - IIT - Kanpur

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

Lecture 1 - Introduction  
Lecture 2 - A Brief History of Rocket Propulsion and ISRO  
Lecture 3 - Types of Rocket Engine  
Lecture 4 - Fundamentals of Aero-thermodynamics  
Lecture 5 - Control Volume Analysis and Governing Equations  
Lecture 6 - Adiabatic Steady 1-D flow and Speed of Sound  
Lecture 7 - Basics of Thermochemistry  
Lecture 8 - Adiabatic Flame Temperature and Chemical Equilibrium  
Lecture 9 - Ideal Rocket Engine, Thrust Equation and Performance Parameters  
Lecture 10 - Performance Parameters of Rocket Engine  
Lecture 11 - Performance Parameters of Rocket Engine (Continued...)  
Lecture 12 - Ideal Nozzle  
Lecture 13 - Rocket Nozzle  
Lecture 14 - Convergent Nozzle  
Lecture 15 - Convergent-Divergent Nozzle and Shock Reflection  
Lecture 16 - Effect of Back Pressure and Thrust Coefficient  
Lecture 17 - Thrust Coefficient  
Lecture 18 - Characteristics Velocity, Combustion Efficiency and Thrust Effectiveness  
Lecture 19 - Actual Rocket Nozzle Characteristics  
Lecture 20 - Flight Performance of a Rocket Vehicle  
Lecture 21 - Flight Performance of a Rocket Vehicle  
Lecture 22 - Flight Trajectory of Single Stage Rocket Vehicle  
Lecture 23 - Orbital Mechanics  
Lecture 24 - Types of Orbits  
Lecture 25 - Orbital and Escape Velocity  
Lecture 26 - Interplanetary Transfer Path  
Lecture 27 - Multi-staging Rocket  
Lecture 28 - Chemical Propellants-Characteristics and Classification  
Lecture 29 - Solid and Composite Propellants

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- Lecture 30 - Composite Propellants and it's Manufacturing
- Lecture 31 - Classification of Liquid Propellants
- Lecture 32 - Solid Propellant Rocket Engine
- Lecture 33 - Propellant Burning Mechanism and Flame Structure
- Lecture 34 - Composite Propellant Combustion
- Lecture 35 - Regression Rate of Solid Propellant and Effect of Operating Parameters
- Lecture 36 - Characteristics of Solid Propellants
- Lecture 37 - Effect of Acceleration and Particle Size on Burning Rate
- Lecture 38 - Erosive Burning, Effect of Propellant Temperature and Thermal Model
- Lecture 39 - Chamber Pressure in Solid Propellant Rocket Engine
- Lecture 40 - Types of Propellant Grains
- Lecture 41 - Types of Solid Propellant Grains and Evolution of Burning Surface
- Lecture 42 - Burning Stability and Ignition System in SPRE
- Lecture 43 - Liquid Propellant Rocket Engine
- Lecture 44 - Injection System in LPRE
- Lecture 45 - Atomization of Liquid Propellants
- Lecture 46 - Types of Injection System in LPRE
- Lecture 47 - Analysis of Impinging Atomizer
- Lecture 48 - Injection Distributor and Combustion Process in LPRE
- Lecture 49 - Variation of Gas Specific Volume and Combustion Chamber Geometry
- Lecture 50 - Liquid Propellant Feed System in LPRE
- Lecture 51 - Turbo-Pump Feed Configuration
- Lecture 52 - Ignition System in LPRE
- Lecture 53 - Cooling of Thrust Chamber and Nozzle of a Rocket Engine
- Lecture 54 - Cooling System of Rocket Engine (Continued...)
- Lecture 55 - Modes of Heat Transfer through combustion Chamber Wall and Nozzle Wall
- Lecture 56 - Heat Transfer Analysis of Cooling System
- Lecture 57 - Hybrid Propellant Rocket Engine
- Lecture 58 - Regression Rate of Solid Fuel Grain in HPRE and Types of Port Configurations
- Lecture 59 - Non-Chemical Rocket Engine
- Lecture 60 - Electromagnetic Thruster, Nuclear and Solar Rocket Engine