

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

NPTEL Video Course - Aerospace Engineering - NOC:Rocket Propulsion

Subject Co-ordinator - Prof. K. Ramamurthi, Prof. S. Varunkumar

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Introduction  
Lecture 2 - Motion in Space  
Lecture 3 - Rotational Frame of Reference and Orbital Velocities  
Lecture 4 - Velocity Requirements  
Lecture 5 - Theory of rocket propulsion  
Lecture 6 - Rocket Equation and Staging of Rockets  
Lecture 7 - Review of Rocket Principles  
Lecture 8 - Examples Illustrating Theory of Rocket Propulsion and Introduction to Nozzles  
Lecture 9 - Theory of Nozzles  
Lecture 10 - Nozzle Shape  
Lecture 11 - Area Ratio of Nozzles  
Lecture 12 - Characteristic Velocity and Thrust Coefficient  
Lecture 13 - Divergence Loss in Conical Nozzles and the Bell Nozzles  
Lecture 14 - Unconventional Nozzles and Problems in Nozzles  
Lecture 15 - Criterion for Choice of Chemical Propellants  
Lecture 16 - Choice of Fuel-Rich Propellants  
Lecture 17 - Performance Prediction Analysis  
Lecture 18 - Factors Influencing Choice of Chemical Propellants  
Lecture 19 - Low energy liquid propellants and Hybrid propellants Chapter 5  
Lecture 20 - Introduction to Solid Propellant Rockets  
Lecture 21 - Burn Rate of Solid Propellants and Equilibrium Pressure in Solid Propellant Rockets  
Lecture 22 - Design Aspects of Solid Propellant Rockets  
Lecture 23 - Burning Surface Area of Solid Propellant Grains  
Lecture 24 - Ignition of Solid Propellant Rockets  
Lecture 25 - Review of Solid Propellant Rockets  
Lecture 26 - Feed Systems for Liquid Propellant Rockets  
Lecture 27 - Feed System Cycles for Pump Fed Liquid Propellant Rockets  
Lecture 28 - Analysis of Gas Generator and Staged combustion cycles and introduction to injectors  
Lecture 29 - Injectors, Cooling of Chambers and Mixture Ratio Distribution

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- Lecture 30 - Efficiencies due to mixture ratio distribution and incomplete vaporization
- Lecture 31 - Pumps and Turbines
- Lecture 32 - Review of Liquid Bi-propellant Rockets and Introduction to Mono-propellant Rockets
- Lecture 33 - Introduction to Hybrid Rockets and a Simple Illustration of Combustion instability in Liquid Prop
- Lecture 34 - Principles of Electrostatic and Electromagnetic Rockets
- Lecture 35 - Electrical Thrusters
- Lecture 36 - Electrical and Nuclear Rockets; Advanced Propulsion