NPTEL Video Course - Aerospace Engineering - Combustion

Subject Co-ordinator - Prof. S.R. Chakravarthy

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Introduction
Lecture 2 - Chemical Reactions, Heats of Reaction and Formation
Lecture 3 - Sensible Enthalpy and Adiabatic Flame Temperature
Lecture 4 - Dissociation of Products, Role of Pressure
Lecture 5 - Numerical Calculation of Adiabatic Flame Temperature, Chemical Kinetics 1
Lecture 6 - Chemical Kinetics 2
Lecture 7 - Equilibrium Reactions, Global Kinetics, Order of Reaction
Lecture 8 - Reduced Chemistry, Steady State Approximation
Lecture 9 - Steady State Approximation, Partial Equilibrium Approximation
Lecture 10 - Partial Equilibrium Approximation, Chemical Explosions
Lecture 11 - Combining Chemical and Thermal Processes 1
Lecture 12 - Combining Chemical and Thermal Processes 2
Lecture 13 - Combining Chemical and Thermal Processes 3
Lecture 14 - Combining Chemical and Thermal Processes 4
Lecture 15 - Mass and Molar Diffusion, Fick's Law
Lecture 16 - Conservation Equations for Multi-Component Mixtures
Lecture 17 - Multi-Component Diffusion Equation
Lecture 18 - Multi-Component Momentum Equation
Lecture 19 - Energy Equation
Lecture 20 - One Dimensional Steady Flow
Lecture 21 - Schvab-Zeldovich Formulation 1
Lecture 22 - Schvab-Zeldovich Formulation 2
Lecture 23 - Rankine-Hugoniot Relations 1
Lecture 24 - Rankine-Hugoniot Relations 2
Lecture 25 - Rankine-Hugoniot Relations 3
Lecture 26 - Velocity, Temperature and Entropy Variation along Hugoniot Curve
Lecture 27 - Laminar Premixed Flames
Lecture 28 - Laminar Premixed Flames - Corrections
Lecture 29 - Laminar Premixed Flames - Rigorous Analysis 1

Lecture 30 - Laminar Premixed Flames - Rigorous Analysis 2
Lecture 31 - Flame Speed Dependencies, G-Equation
Lecture 32 - Bunsen Burner 1
Lecture 33 - Bunsen Burner 2
Lecture 34 - Flame Stabilisation 1
Lecture 35 - Flame Stabilisation 2
Lecture 36 - Ignition
Lecture 37 - Burke-Schumann Problem 1
Lecture 38 - Burke-Schumann Problem 2
Lecture 39 - Burke-Schumann Problem 3
Lecture 40 - Flame Structure
Lecture 41 - Mixture Fraction Formulation 1
Lecture 42 - Mixture Fraction Formulation 2
Lecture 43 - Droplet Burning 1
Lecture 44 - Droplet Burning 2
Lecture 45 - Spray Combustion 1
Lecture 46 - Spray Combustion 2
Lecture 47 - Turbulent Combustion 1
Lecture 48 - Turbulent Combustion 2
Lecture 49 - Combustion Instabilities
Lecture 50 - Detonations
Lecture 51 - Detonation Wave - ZND Structure