

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

NPTEL Video Course - Chemical Engineering - NOC:Introduction to Interfacial Waves

Subject Co-ordinator - Prof. Ratul Dasgupta

Co-ordinating Institute - IIT - Bombay

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

- Lecture 1 - Introduction
- Lecture 2 - Coupled, linear, spring-mass systems
- Lecture 3 - Coupled, linear, spring-mass systems (Continued...)
- Lecture 4 - Coupled, linear, spring-mass systems (Continued...)
- Lecture 5 - Coupled, linear, spring-mass system: continuum limit
- Lecture 6 - Normal modes of a string fixed at both ends
- Lecture 7 - Vibrations of clamped membranes
- Lecture 8 - Vibrations of clamped membranes (Continued...)
- Lecture 9 - Introduction to Jacobian elliptic functions
- Lecture 10 - The non-linear pendulum
- Lecture 11 - The non-linear pendulum (Continued...)
- Lecture 12 - Time period of the non-linear pendulum
- Lecture 13 - Introduction to perturbation methods
- Lecture 14 - Perturbation methods (Continued...)
- Lecture 15 - Non-dimensionalisation
- Lecture 16 - Perturbative solution to the projectile equation
- Lecture 17 - Perturbative solution to the nonlinear pendulum
- Lecture 18 - Lindstedt-Poincare technique
- Lecture 19 - Method of multiple scales
- Lecture 20 - Method of multiple scales (Continued...)
- Lecture 21 - Multiple scale analysis for damped-harmonic oscillator
- Lecture 22 - Duffing equation using multiple scales
- Lecture 23 - Duffing equation (Continued...)
- Lecture 24 - Kapitza pendulum
- Lecture 25 - Introduction to Floquet theory
- Lecture 26 - Floquet theorem (Continued...)
- Lecture 27 - Floquet analysis of the Mathieu equation
- Lecture 28 - Introduction to waves on an interface
- Lecture 29 - Linearized wave equations in deep water

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- Lecture 30 - Linearized wave equations in deep water: dispersion relation
- Lecture 31 - Linearised deep-water surface gravity waves (Continued...)
- Lecture 32 - Standing and travelling waves in deep water
- Lecture 33 - Cauchy-Poisson initial value problem for surface-gravity waves in deep water
- Lecture 34 - Cauchy-Poisson problem (Continued...)
- Lecture 35 - Cauchy-Poisson problem in cylindrical geometry
- Lecture 36 - Cauchy-Poisson problem in cylindrical geometry (Continued...)
- Lecture 37 - Group-velocity and the Cauchy-Poisson problem
- Lecture 38 - Cauchy-Poisson problem for delta function initial condition
- Lecture 39 - Cauchy-Poisson problem for delta function initial condition (Continued...)
- Lecture 40 - Capillary-gravity waves
- Lecture 41 - Waves on a pool of finite depth
- Lecture 42 - Axisymmetric Cauchy-Poisson problem visualisation: the pebble in the deep pond problem
- Lecture 43 - Rayleigh-Plateau capillary instability
- Lecture 44 - Rayleigh-Plateau capillary instability (Continued...)
- Lecture 45 - Rayleigh-Plateau capillary instability on thin film coating a rod
- Lecture 46 - Rayleigh-Plateau capillary instability of a cylindrical air column in a liquid
- Lecture 47 - Mechanism of the Rayleigh-Plateau instability
- Lecture 48 - Shape oscillations of a spherical interface
- Lecture 49 - Shape oscillations of a spherical interface (Continued...)
- Lecture 50 - Shape oscillations of a spherical interface (Continued...)
- Lecture 51 - Analysis of $l=0$ and $l=1$ modes for a spherical drop
- Lecture 52 - Faraday waves on an interface - stability of time dependent base states
- Lecture 53 - Mathieu equation for Faraday waves
- Lecture 54 - Applications of Faraday waves - atomisation and spray formation
- Lecture 55 - Waves and instability on density stratified shear flows - the KH model
- Lecture 56 - Limits of KH dispersion relation: Rayleigh-Taylor instability
- Lecture 57 - KH dispersion relation : model of wind wave generation
- Lecture 58 - Helmholtz instability of a vortex sheet and summary
- Lecture 59 - Derivation of the Stokes travelling wave
- Lecture 60 - Derivation of the Stokes travelling wave (Continued...)
- Lecture 61 - Derivation of the Stokes travelling wave (Continued...)