

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

NPTEL Video Course - Chemistry and Biochemistry - NOC:Time Dependent Quantum Chemistry

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Co-ordinating Institute - IISc - Bangalore

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

- Lecture 1 - Introduction to TDSE
- Lecture 2 - Solution to TDSE, Stationary and Non-stationary States
- Lecture 3 - Electron and Vibrational Superposition States
- Lecture 4 - Optical Analogy to Quantum Superposition
- Lecture 5 - Introduction to Python Programming
- Lecture 6 - Simple Computation with Python Programming
- Lecture 7 - Plotting Graph with Python Programming
- Lecture 8 - Meaning of Probability Density
- Lecture 9 - Time Evolution of Normalization Constant
- Lecture 10 - Expectation Value and its Time Evolution
- Lecture 11 - Equation of Continuity
- Lecture 12 - Bohmian Mechanics
- Lecture 13 - Bohmian Mechanics and Standard Interpretation
- Lecture 14 - Grid Representation of Wavefunction
- Lecture 15 - Normalizing the Discretized Wavefunction and Finding Expectation Value
- Lecture 16 - Plane Matter Wave and Wavepacket
- Lecture 17 - Wavepacket
- Lecture 18 - Stationary Gaussian Wavepacket
- Lecture 19 - Travelling Gaussian Wavepacket
- Lecture 20 - General Form of the Gaussian Wavepacket
- Lecture 21 - Fourier Transform of a wavefunction
- Lecture 22 - x-grid to k-grid
- Lecture 23 - Fourier Transform using fft
- Lecture 24 - Hilbert Space and Its Properties
- Lecture 25 - Basis Set Approach to Quantum Mechanics
- Lecture 26 - Matrix Algebra
- Lecture 27 - Eigenvalue and Eigenfunction
- Lecture 28 - Matrix Representation of Operators
- Lecture 29 - Matrix Representation of Hamiltonian Operator

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- Lecture 30 - Python Tutorial 4 (Eigenvalue and Eigenfunction)
- Lecture 31 - Python Tutorial 4 (Eigenvalue and Eigenfunction)
- Lecture 32 - Time Evolution Operator
- Lecture 33 - Split Operator Metho
- Lecture 34 - Numerical Implementation of Split Operator Method
- Lecture 35 - Wavepacket Dynamics under zero interaction potential
- Lecture 36 - Wavepacket Dynamics under zero interaction potential (Continued...)
- Lecture 37 - Wavepacket Dynamics under linear interaction potential
- Lecture 38 - Quantum Adiabatic Theory
- Lecture 39 - Formal Derivation of Quantum Adiabatic
- Lecture 40 - Geometric Phase and Dynamical Phase
- Lecture 41 - Nonradiative Transition - Part 1
- Lecture 42 - Nonradiative Transition - Part 2
- Lecture 43 - Nonradiative Transition
- Lecture 44 - Quantum Dissipative Dynamics
- Lecture 45 - Quantum Dissipative Dynamics
- Lecture 46 - Formal Derivation of Dissipative Quantum Dynamics
- Lecture 47 - Classical Description of Light
- Lecture 48 - Vector and Scalar Potential
- Lecture 49 - Vector and Scalar Potential
- Lecture 50 - Master Equation of Light
- Lecture 51 - Hamiltonian for Light-Atom Interaction
- Lecture 52 - Hamiltonian for Light-Atom Interaction
- Lecture 53 - Absorption and Stimulated Emission
- Lecture 54 - Absorption and Stimulated Emission
- Lecture 55 - Time Correlation Function
- Lecture 56 - Fourier Transform of Time Correlation Function