



B. Sc. (Physics) SEMESTER-V

Paper-I (Atomic physics, free electron theory and Statistical physics)

Unit- I

Atomic physics- Introduction (Revision of Bohr's model, Somerfield and Chadwick)

https://youtu.be/Mxow_MvhZX0?feature=shared

Vector atom model

<https://youtu.be/eMmNPGdx1Ec?feature=shared>

Stern-Gerlach experiment

<https://youtu.be/M0b9WJzQqKA?feature=shared>

<https://youtu.be/eMmNPGdx1Ec?feature=shared>

Spinning of electron, Space quantization, Selection rules

<https://youtu.be/DCrvanB2UWA?feature=shared>

Quantum numbers, L-S and J-J Coupling, Pauli's exclusion principal, Hunds rule

<https://youtu.be/Aoi4j8es4gQ?feature=shared>

Zeeman effect, Normal Zeeman effect, Anomalous Zeeman effect, Stark effect

https://youtu.be/AFOS5cWDA_o?feature=shared

Unit II

Free electron theory- Drude Lorentz model, Mean free path

<https://youtu.be/ttdtdLfn9HU?feature=shared>

Electrical and thermal conductivity

<https://youtu.be/nPfx89iPM9s?feature=shared>

Wiedemann Franz law (Derivation), Density of states

<https://youtu.be/nPfx89iPM9s?feature=shared>

Fermi energy, Fermi temperature

<https://youtu.be/cBd5Ka9y7EU?feature=shared>

Band theory of solids- Bloch theorem (statement only)

<https://youtu.be/tIClkrWwsU?feature=shared>

Kroning Penny model, Concept of hole

<https://youtu.be/itOlhNe5KHU?feature=shared>

Hall effect, Energy bands in solid, distinction between metal, semiconductor and insulator

<https://youtu.be/IB7RpXmVBJU?feature=shared>



Unit III

Statistical physics- μ - space, Gamma space

<https://youtu.be/rmK-snKFBSI?feature=shared>

probability distribution, thermodynamic probability, Principle of a priori probability

<https://youtu.be/W1BSn8cxEFE?feature=shared>

Boltzmann's entropy relation, accessible and inaccessible states, macro and micro states

<https://youtu.be/o1EinUCgFsw?feature=shared>

Maxwell- Boltzmann distribution law, its application to molecular speed, distinction between mean, r. m. s. and most probable speed values

<https://youtu.be/wWb7jPoHqGk?feature=shared>

Unit IV

Statistical physics- Bose-Einstein statistics, its application to black body radiation

<https://youtu.be/8INHml45-6Y?feature=shared>

Planck's radiation law, Estimation of temperature of sun, Bose- Einstein condensation

<https://youtu.be/76OyuYlc2ho?feature=shared>

Fermi-Dirac distribution and its application to free electrons in a metal, concept of negative temperature

<https://youtu.be/Ww9wcs3yNWI?feature=shared>

Fermi level and Fermi temperature, comparison between M-B, B-E and F-D statistics

<https://youtu.be/ewpgTWc4tuo?feature=shared>