

Introduction to Contemporary Physics part II

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Syllabus

1. Atomic theory of matter, chemical foundations of atomic theory; ideal gas laws and atomic properties, Avogadro's number.
2. Wave-corpuseular duality, photons, matter waves.
3. Structure of atoms, spectral lines.
4. Electron spin, Pauli's principle, quantum statistics.
5. Atomic structure, energy shells, periodic system of elements.
6. Atoms in external electromagnetic fields.
7. Planck's law, electron gas in metals (applications of quantum statistics).
8. Molecules, atomic bonds, molecular states.
9. Molecular spectra, Raman effect.
10. Electronic structure of solids.
11. Atomic nucleus, sizes and masses of nuclei, isotopes.
12. Nuclear physics, radioactive decay, nuclear reactions.
13. Nuclear energy.
14. Proton, neutron, other elementary particles.
15. Basic components of matter, standard model.