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RGPV B.Tech – First Year Syllabus

BT-201: Engineering Physics

Unit I: Quantum Mechanics

- Wave nature of particles
- Time-dependent and time-independent Schrödinger equation
- Particle in a 1D box, Born interpretation
- Wave packets, group and phase velocity, uncertainty principle

Unit II: Wave Optics

- Huygens' principle, interference (wavefront & amplitude splitting)
- Young's double slit, Newton's rings, Michelson & Mach-Zehnder interferometers
- Diffraction: single slit, circular aperture, Rayleigh criterion
- Diffraction gratings and resolving power

Unit III: Solid State Physics

- Free electron theory, Fermi level, density of states
- Bloch's theorem, Kronig-Penney model (intro only)
- Energy bands, PN junction, Zener diode, solar cell
- Hall effect

Unit IV: Lasers and Optical Fibers

- Einstein's coefficients, population inversion
- Types of lasers: He-Ne, CO_2, ruby, Nd:YAG
- Laser properties: coherence, directionality, brightness
- Optical fibers: acceptance angle, numerical aperture, attenuation

Unit V: Electrostatics and Electromagnetism

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- Electric field and potential, displacement vector
- Dielectrics, gradient, divergence, curl
- Stokes' and Gauss' theorems, continuity equation
- Maxwell's equations, Poynting vector

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- RGPV Notes – First Year Subjects

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