

# Download File PDF Engineering Physics Syllabus

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## Course Content & Grade

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			Theory	Practical	
B.TECH. Common	Engineering Physics	BT-2001	Min. "D"	Min. "D"	5.0

**Unit I**  
**Quantum Physics**  
Group and particle velocities & their relationship, Uncertainty principle with elementary proof and applications (determination of position of a particle by a microscope, non existence of electron in nucleus, diffraction of an electron beam by a single slit, Compton scattering, Wave function and its properties, energy and momentum operators; time dependent and time independent Schrodinger wave equation; Application of time independent Schrodinger wave equation to particle trapped in a one dimensional square potential well (derivation of energy eigen values and wave function)

**Unit II**  
**Wave Optics**  
Interference: Fresnel's biprism, Interference in thin films (due to reflected and transmitted light), interference from a wedge shaped thin film, Newton's rings and Michelson's interference experiments and their applications. Diffraction at single slit, double slit and n-slits (diffraction grating). Resolving power of grating and prism. Concept of polarized light, Brewster's law, Double refraction, Nicol prism, quarter & half wave plate.

**Unit III**  
**Nuclear Physics**  
Nuclear liquid drop model (semi empirical mass formula), nuclear shell model. Linear Particle accelerators: Cyclotron, general description of Synchrotron, Synchrocyclotron, and Betatron, Geiger-Müller Counter, Motion of charged particles in crossed electric and magnetic fields. Uses of Bainbridge and Aston mass Spectrographs.

**Unit IV**  
**Solid State Physics**  
Qualitative discussion of Kronig Penny model (no derivation), Effective mass, Fermi-Dirac statistical distribution function, Fermi level for intrinsic and Extrinsic Semiconductors, Zener diode, tunnel diode, photo-diode, solar-cells, Hall effect. Superconductivity: Meissner effect, Type I and Type II superconductors, Di-electric polarization, Complex permittivity, dielectric losses

**UNIT V**  
**Laser and FIBre Optics**  
Laser: Stimulated and spontaneous processes, Einstein's A & B Coefficients, transition probabilities, active medium, population inversion, pumping. Optical resonator, characteristics of laser beam. Coherence, directionality and divergence. Principles and working of Ruby, Nd:YAG, HeNe & Carbon dioxide Lasers with energy level diagrams. Fundamental idea about optical FIBre, types of FIBres, acceptance angle & cone, numerical aperture, V-number, propagation of light through step index FIBre (ray theory) pulse dispersion, attenuation, losses & various uses. Applications of lasers and optical FIBres.

- Reference Books:**
1. Engineering Physics- Purnima Swarup Khare, Laxmi Publication
  2. A Text Book of Engg Physics - N. Gupta & S.K. Tripathy, Dhampat Rai & Co., Delhi
  3. Concepts of Modern Physics- H.Y. Patel, DMU
  4. Solid State Physics by Kittel, Wiley India
  5. Engineering Physics: Fundamentals and Modern Applications - by Purnima Swarup Khare, Infinity Press Publications

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